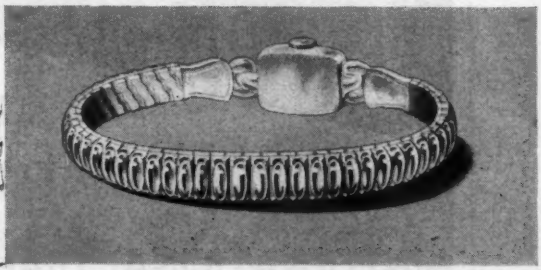
The American horologist and jeweler

INCORPORATING HOROLOGY
THE NATIONAL MAGAZINE
FOR ADVANCEMENT IN TIMEKEEPING

. 19 APRIL 1952 No. 4

The fine points of a profession are handed down from generation to generation: technique, artistry, attention to detail. The result: watch bands beyond comparison for dependability and design. Shown is the Gemex Jewel, No. 431 . . . retails for $11.95.



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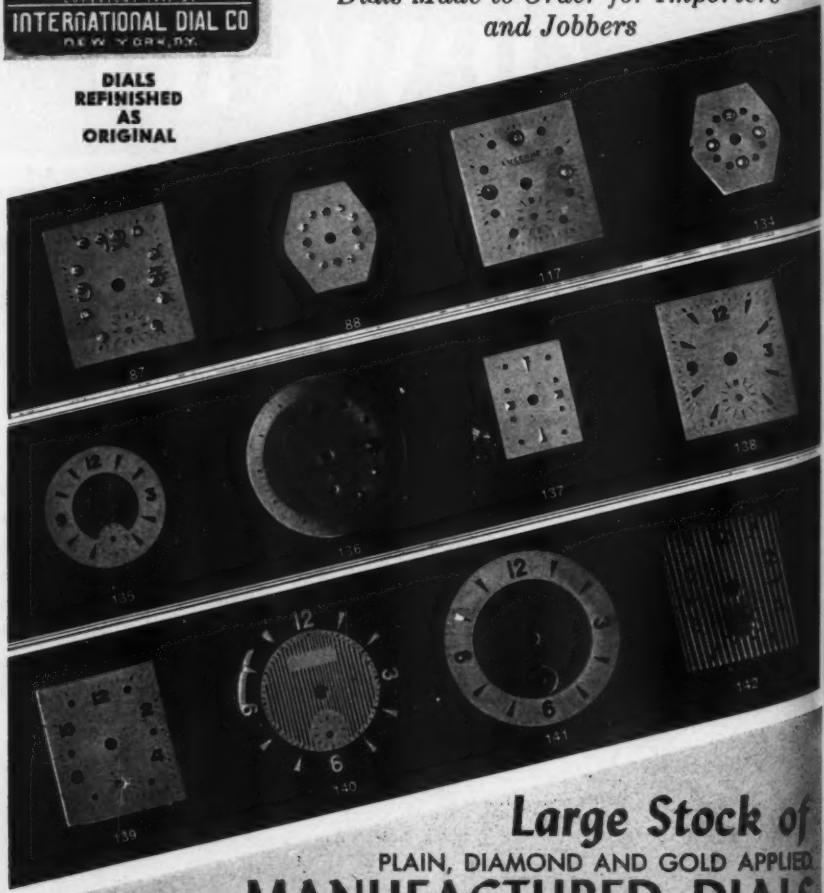

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6AP (6½ oval)
15J, $6.50; 17J ..... $ 6.50

6AE-6AF (oval tonneau)
15J, $6.50; 17J ..... $ 6.50

7AM (7¾ round)
17J ..... $ 8.00

8AH 17J $10.00

13AF 15-17J $10.00

5AB (AS 1012)
17J $12.00

7AP
17J $10.00
21J $14.00

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Incorporating Horology

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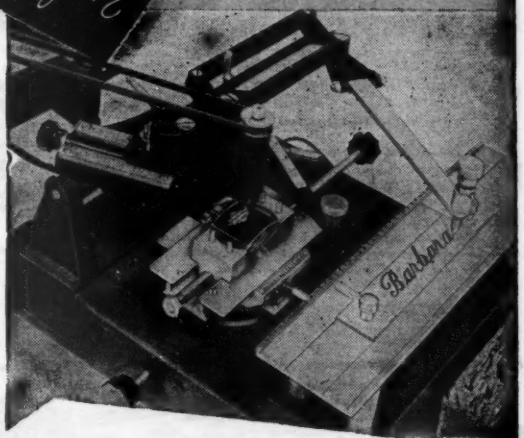

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2) The convex part is absolutely concentric and the spherical radius constant in any particular series, which ensures perfect centring of the oil. The jewel will also be set perfectly flat and the risk of breakage lessened.

3) Consequently the space between the highest point of the convex surface and the underside of the endstone will therefore not vary.

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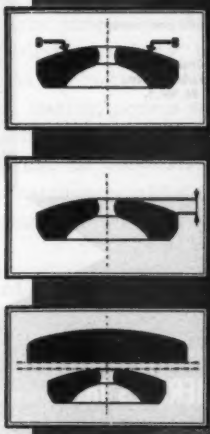
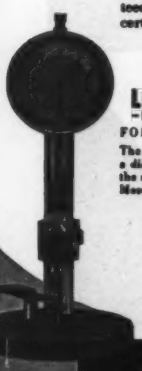
The ruby balance jewel with its guaranteed convexity



Manufacturers, wholesalers, retailers and repairers

should use Seitz balance jewels with the guaranteed convexity; they will contribute greatly to the certain and stable timing of all watches.



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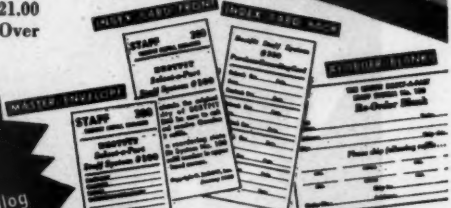

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This is advertising that tells *your* story to *your* customers. It describes your unique and valuable services to the community And it never fails to urge your customers to call upon you for advice and counsel in buying the perfect gift.

Merchandising, too, makes more sales! The final step in closing a sale comes *in your store.* That's why the free Watchmakers of Switzerland selling aids you receive throughout the year (like this brochure: "The Inside Story of the Fine Swiss Watch") are designed for use by *your own salespeople!*

Public Relations adds still more to your prestige and profits! The Watchmakers of Switzerland create *—and place—*a constant flow of news about you, the Quality Jeweler, and your fine products. Your customers read these items in local newspapers—hear and see them on radio, TV and in the newsreels!

PROFIT TWO BIG WAYS

of Switzerland Campaign

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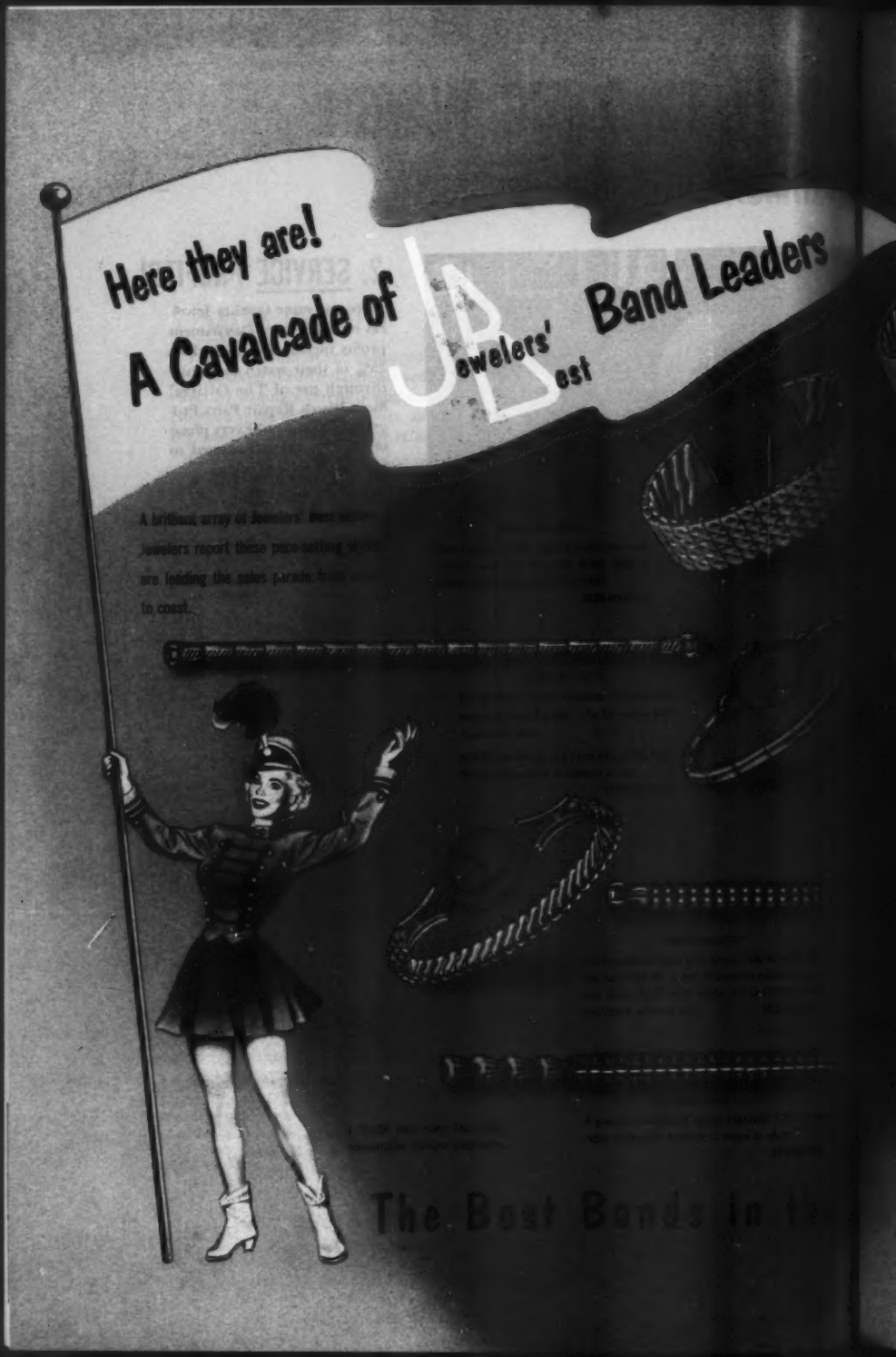
"For the gifts you'll give with pride—let your jeweler be your guide"

The WATCHMAKERS OF SWITZERLAND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are leading the sales parade from
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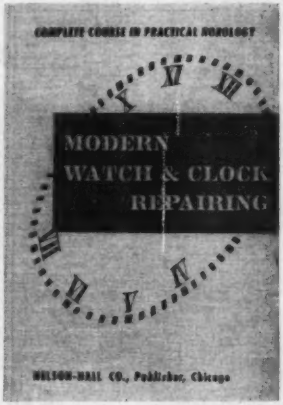
JACOBY-BENDER, INC.
Land are JB Jewelers' Best



Modern Watch and Clock Repairing

By P. Buford Harris **B-246**

This is a Benjamin Franklin Illustrated Home-Study course complete in one volume. The course is informal, helpful and personal. The aim of this course is to teach you how to understand modern watches and clocks, teach you how to locate troubles, repair, clean, adjust and do all jobs the average watchmaker is daily being called upon to do. Necessary information on tools and materials is also included. Illustrated. 233 pages. **$4.95**

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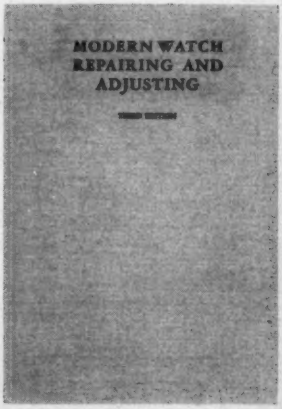
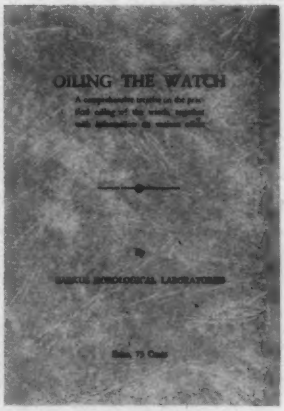
By John J. Bowman & Emile Borer **B-120**

This is the third revised edition. It is a practical help to the watchmakers who wish to improve their ability. It should be of great value to young men trying to learn watch repairing under apprenticeship training, and who may not be able to obtain the advantages of instruction in a good school of horology. Illustrated. 188 pages. **$3.00**





OILING THE WATCH

By Barkus Horological Laboratories **B-169**

This is a comprehensive treatise on the practical oiling of the watch, together with information on various oilers. It is not theory, but information gained from actual experience of many years of bench work by actual watchmakers. The edition is divided into two parts; Oiling the Watch and Watch Oilers and Bench Oil Cups. Illustrated. 49 pages. **75 cents**

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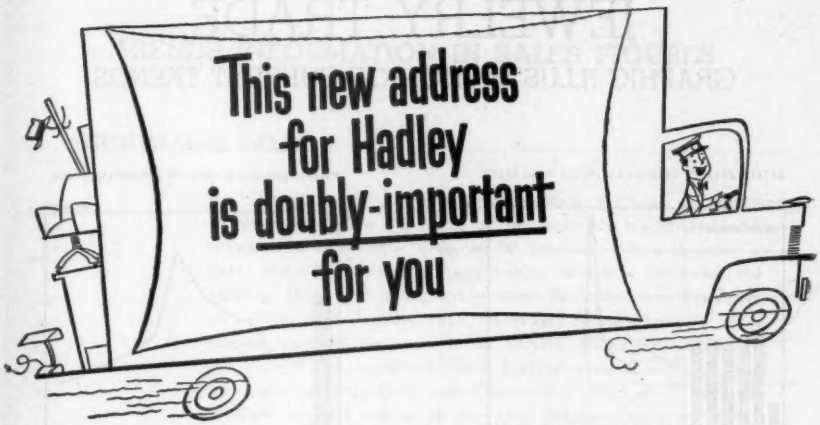

1. **One important result** of the purchase of The Hadley Company by the Elgin National Watch Company, is that *we're moving* our general offices to Elgin, Illinois. From now on, all correspondence about the Hadley line of high-quality watch attachments and men's jewelry should be mailed to our new address:

THE HADLEY COMPANY
GENERAL OFFICES, ELGIN, ILLINOIS

(Our manufacturing facilities will remain at Providence, R. I., where we will also maintain a service office. Please address all *inquiries about repair work only*, to: The Hadley Company, Service Office, Providence, Rhode Island.)

2. **Another important result** of this merger is that we're *moving ahead*, too! The Hadley line is now one of the Elgin family of quality products. Now that we have combined the design, production and merchandising "know-how" of Hadley and Elgin, big new developments are coming soon. **Why not watch for them?**

HADLEY

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ELGIN, ILLINOIS

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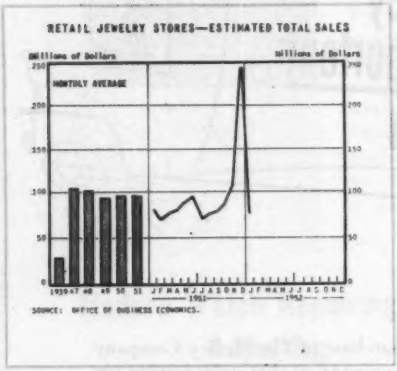
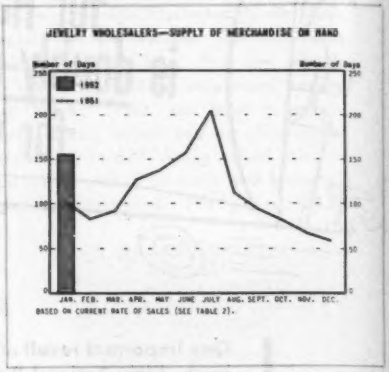
Service Office: (for service work only) Providence, R. I.

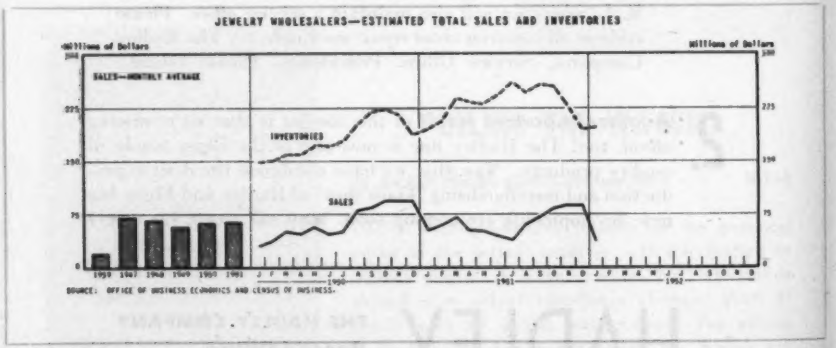
TRENDS IN THE
JEWELRY TRADE
GRAPHIC ILLUSTRATION OF CURRENT TRENDS



Based on the current rate of sales of 91 jewelry wholesalers reporting inventories in conjunction with sales, stocks on hand represented approximately 155 days' business, about 96 days' supply more than on hand for the previous month, and 48 days' supply more than reported for January 1951.


JEWELRY WHOLESALERS—SUPPLY OF MERCHANDISE ON HAND
Number of Days
Number of Days
1952
1951
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
BASED ON CURRENT RATE OF SALES (SEE TABLE 2).

Based on estimates prepared by the office of business economics, the estimated total sales for all retail jewelry stores for the month of January, 1952, were $76 million. This indicates a drop of $168 million below December and a decrease of $6 million under January sales of 1951.



The estimated total sales of all jewelry wholesalers during January, 1952, amounted to $36 million. This shows a drop of $50 million from the previous month. It also indicates a drop of $17 million below January of 1951. The total inventories of all jewelry wholesalers at the end of January, 1952, were estimated at $199 million, as compared with $194 million for December.

FIGURES & GRAPHS FROM LATEST GOVERNMENT REPORTS

TRENDS INFORMATION IN SALES FIGURES

WHOLESALER SALES

The January sales of jewelry wholesalers declined seasonally 58 per cent below the level of the previous month and also reflected a substantial drop of 30 per cent below January a year ago. Regionally, all geographic divisions followed the national trend indicating sharp sales declines from December as well as from January 1951. Decreases below December sales ranged from 48 per cent in the Middle Atlantic region to 70 per cent in the combined South Central area. Compared with last year, sales declines varied between a drop of 17 per cent in New England and a 38 per cent decrease reported in the West North Central area. Total sales of all jewelry wholesalers during January were estimated at $36 million, a drop of $50 million from the previous month and $17 million below January of last year.

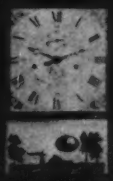
RETAILER SALES

The estimated total sales for all retail jewelry stores for the month of January, 1952, were $76 million. This shows a drop of $168 million below the December 1951 sales figures. As compared with the January 1951 figures, a decrease of $6 million is indicated.

FOREIGN TRADE

The estimated total exports of clocks, watches and parts for January, 1952 were $324, as compared to $475 for the previous month and $518 for the corresponding month a year ago. The imports of watches and watch movements for January, 1952 were 763 units valued at $3,660. This compares with 992 units valued at $4,581 for the previous month and 861 units valued at $4,133 for the same month a year ago. The estimated total import value for diamonds (cut) for January, 1952, was $3,469 as compared to $3,843 for the previous month and $5,818 for the same month a year ago. (All values in thousands of dollars; quantities in thousands of units.)

THE BOOK OF AMERICAN CLOCKS



Brooks Palmer

Everyone who has felt the fascination of old timekeepers from the novice collector of antiques to the most expert horologist, will take endless pleasure in this fine panorama of American clocks and watches. The more than 300 illustrations range from rare masterpieces of the early craftsmen through all the important types of timekeepers developed during more than two hundred and fifty years. The resulting volume is thus the most complete book on American clocks in existence. The Book of American Clocks will live for years as the standard work in its field—an ever-useful reference volume, and a handsome gift book for all lovers of Americana.

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Volume 19 **April, 1952** **No. 4**

The Watch of Tomorrow...

Electronic Wrist Watch Developed By Elgin Runs on Stored Energy

'Energy Capsule' Powers Microscopic Motor; Mainspring, Winding Mechanism Are Both Eliminated

A LABORATORY model of the electronic wrist watch of tomorrow, a fantastic timepiece that carries its own source of power and runs initially more than a year before its tiny energy capsule needs replacing, was unveiled March 19 by Elgin National Watch Company.

The first watch of its kind ever built, it requires no mainspring or winding mechanism but will keep nearly perfect time because it is driven by a motor that delivers power at an absolutely constant rate. Yet the energy capsule, motor and watch movement together fit inside a man's wrist watch case of conventional size.

Potentially the same electronic principle can be used in women's wrist watches, which are often less than half as big as a man's watch.

The result of research into a field of micro-electroncis never before explored, the motor and energy capsule are the smallest practical units of their kind ever made. They perform in miniature the same function as the power plant of a diesel electric locomotive, yet the watch requires so little power that 10,000,000 of them could be operated from the power consumed by a single 100-watt light bulb.

J. G. Shennan, Elgin president, said that during his company's research on the electronic watch it was learned that Lip Watch Company of Besancon, France, was also working on the problem. In order to improve their overall knowledge of the field, the companies have exchanged information but each has continued to conduct its own research separately. The Lip watch, announced simultaneously in Paris on March 19, differs in many mechanical and electrical respects from the American version.

Shennan would not estimate how soon the new watch could be marketed, but said the present program of testing and evaluation on production models would continue for an

WATCH OF TOMORROW . . . Electronic timepiece developed by Elgin National Watch Company looks like conventional watch but carries its own source of power and will run initially more than a year before tiny energy capsule needs replacing. Smaller in volume than a penny, capsule powers microscopic motor at constant rate, therefore watch keeps nearly perfect time.

extended period to insure that once the watch is marketed in quantity it will be a thoroughly tested and proven timepiece. He explained further that new manufacturing techniques are being developed to handle the unique and difficult materials used in the watches.

He would not speculate on the price of the watch when marketed. Although conceding its construction is simpler than that of conventional timepieces, Shennan said the manufacturing problems are such that it would be some years before the watch can be sold at a price comparable to that of the average conventional watch today.

Research on the watch was restricted during World War II but was expanded immediately thereafter. It was assisted by knowledge of new magnetic alloys and semi-conductive materials which were used to help miniaturize radar and other electronic and electrical equipment.

By using the materials in a new way, and by undertaking exhaustive research in the electro-mechanical and electro-chemical fields, Elgin research men reached a commercial solution of their basic problem, that of reducing the principle of electronic timekeeping to microscopic size.

First they worked on a pocket watch, which seemed a comparatively easy task, and advanced from that project to a further goal—that of doing the job the "hard way", in wrist watch size. This decision came after it was realized that the construction used in a pocket watch might not be applicable to a small wrist watch, but that it would always be possible to enlarge an electronic wrist watch mechanism to fit a pocket piece.

The energy capsule, which is designed for easy replacement by a qualified watchmaker, packs into a cell smaller than the volume of a penny enough energy to keep the watch running more than a year, with ample reserve.

A synchronously controlled motor, powered by the capsule, replaces the mainspring and its associated parts. The winding mechanism is also eliminated.

Because the energy capsule delivers power at an absolutely level rate, Elgin claims the new watch will keep better time than conventional watches using mainsprings.

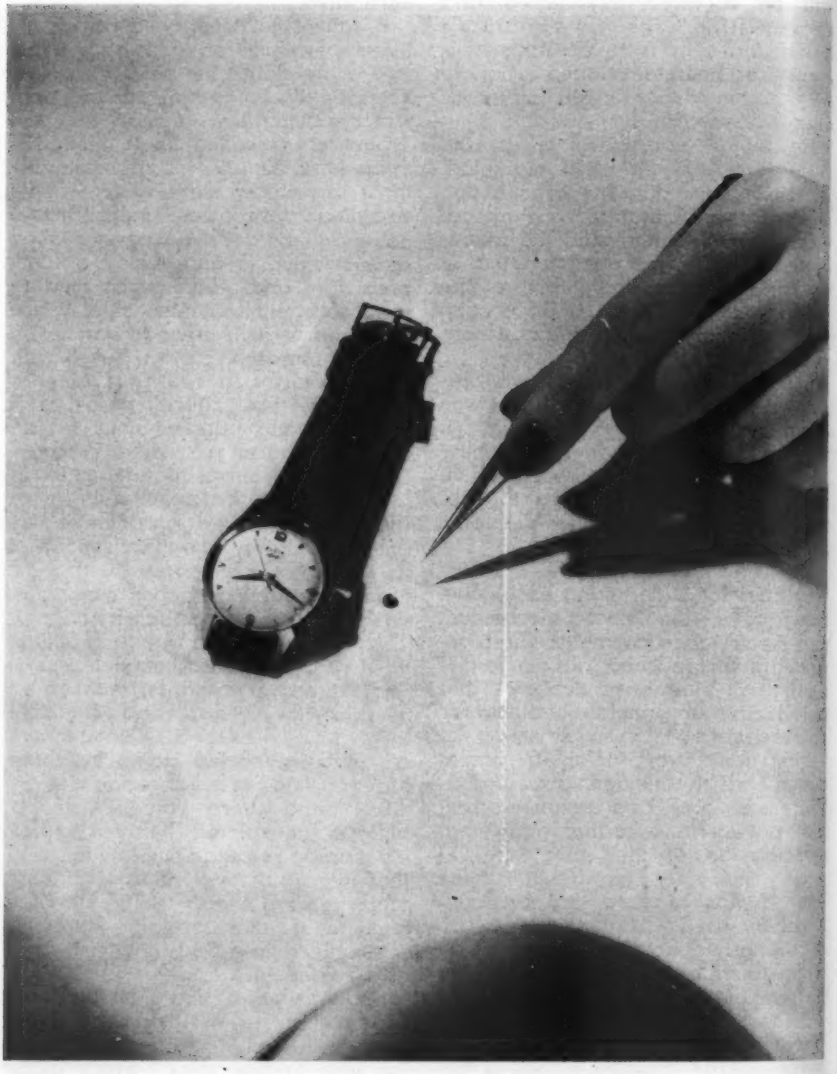
Shennan recalled that only five years ago Elgin's research department announced development of its so-called "durapower" mainspring, a non-magnetic, non-corrosive alloy spring which is guaranteed against breakage, and which is claimed to practically eliminate the chief cause of failure in conventional watches.

In a research project beset with intricate manufacturing problems, one of the most difficult was that of designing and building coils, which are an integral part of any motor. Experimental sub-miniature coils for the electronic watch, slightly more than one-eighth of an inch in diameter and only one-thirty-second of an inch long, were wound with 3,000 turns of insulated copper wire, one-sixth the thickness of human hair.

A far more disturbing problem, however, was that a completely new understanding and interpretation of established physical and chemical laws was required. Conventional calculations, scaled down from the familiar fields of engineering design, were found utterly valueless in this hitherto unexplored field of microelectronics. For example, it was found that the principles of conventional motor design theory no longer applied in a motor capable of producing only one-seventy-five millionth of a horsepower.

Shennan paid tribute to the Elgin research department, headed by George G. Ensign, for the "painstaking and tireless work" which made the new watch possible. He also cited the Armour Research Institute of Chicago, which assisted in several developmental phases of the project.

He predicted that principles used in the watch will find "very definite applications" in the general field of micro-instrumentation.



FLEA POWER . . . Smallest practical coil ever built is used in motor of electronic watch announced Mar. 19, by Elgin National Watch Company. Experimental coil shown here is slightly more than one-eighth of an inch in diameter and only one thirty-second of an inch long, yet it is wound with 3,000 turns of insulated copper wire, one-sixth the thickness of human hair. Motor of watch is powered by tiny energy capsule that keeps timepiece running more than a year before it must be replaced.

History of the Electronic Watch Project

There are two ways of running an industrial research department. Sometimes all the work, and even the thinking of the research men is circumscribed so far as possible to prevent their wandering off into fields which may be interesting, but which are unproductive. The alternative is to give researchers a free rein, in the belief that the scientific mind works best when unfettered.

Elgin, whose research department operates on the latter theory, has one of the largest such organizations in the jeweled watch industry. Its work in such diverse fields as watch lubricants and rust-proof alloys has helped the company maintain a reputation for scientific progress, and its development work on instrumentation problems for the armed forces has continued unbroken since before Pearl Harbor.

The electronic watch was spawned in the research department years ago, first in informal discussion and later as a laboratory project. It made little progress during World War II because of the company's urgent arms production job. But in their musings over a "watch of tomorrow", Elgin researchers had long discarded many other possibilities as impractical or still beyond the scientific horizon.

The electronic principle seemed feasible, however. The possibility of success was recognized to be dependent largely on the improving efficiencies of remarkable new magnetic alloys appearing during the 1930s. Continuing improvements in these materials resulted in the "magic" metals used in radio transmitters and receivers, for example, which permitted the Armed Forces to reduce the size of bulky electronic equipment as much as 75 per cent. Since Elgin's basic problem with the watch was one of miniaturization, these new materials proved a blessing.

When the project first got under way it called simply for an electronic watch, and it was then thought a regular-type balance and hairspring should be used. But many changes and refinements in thinkIng lay immediately ahead. For example, the specification as to size stipulated that it be "no larger than Elgin's present watches", leaving wide open the question of whether it should be a wrist watch or a pocket piece. Quite naturally, therefore, it seemed logical to start with a pocket watch, that being far easier to handle. Initially, too, the work was divided into three basic parts—a source of energy, a motor and a train of gears to drive the hands. But it was not long before these three jobs were in turn split into innumerable sub-projects.

Because Elgin's research department enjoys free rein, the electronic project was already well under way before it gained the official sanction of management—in itself an interesting story of coincidence.

The late T. Albert Potter, president of Elgin from 1932 until he was named chairman of the board in 1948, was not a watch expert by training or experience, but he was highly observant and soon gained an excellent understanding of the company's problems. Particularly, in view of keen competition from imported watches which began in the early 1930s, he sensed the need for something new—a brand new kind of timepiece that would assert Elgin's leadership and arouse the enthusiasm of jewelers and consumers.

Potter knew about electronic clocks. Why not an electronic watch, he wondered? Enthusiastically he summoned George G. Ensign, the company's research director.

Pocket Design Considered

Ensign sat with a poker face as Potter explained his idea. It would be a pocket watch, the president said, with cells carried in another pocket and the two connected by a conventional-looking watch chain which would actually conceal wires leading from the battery to the watch.

He concluded with the inevitable question, "Is it practical?"

Ensign conceded that it was, but he launched into a deliberate and ponderous dissection of the problem: Why not build the source of energy right into the watch itself, in the form of an easily replaceable capsule that would fit inside the watch case such-and-such a way? Then you could build a motor designed to deliver such-and-such a quantity of power to run the watch probably a year before the capsule needed replacing.

TWENTIETH CENTURY ENERGIZER . . . Tiny model of battery illustrates size of energy capsule which powers electronic watch developed by Elgin National Watch Company. Smaller in volume than a penny, the capsule stores enough power to run motor of timepiece more than a year before new capsule is needed. Operating at an absolutely level rate, the watch keeps almost perfect time.

Potter listened incredulously, then raised an eyebrow.

"How do you happen to know so much about electronic watches?" he asked.

Ensign smiled slowly. "Because, Mr. Potter, we've been working on them for some time!"

From that point the project took top priority. Within a short time the research department built a demonstration model to illustrate certain working principles. This model was shown to the board of directors but the researchers themselves balked at it.

A pocket model could be perfected, they conceded, but what then? The market for pocket watches was dwindling fast; everybody wanted a wrist watch. Suppose, after removing all the bugs from this pocket watch, it was found that the same principles could not be used for a wrist watch? That would mean starting over again, almost from scratch. Wasn't it better to do the job the hard way, in wrist-watch size, in the knowledge that a successful wrist-watch construction could always be enlarged to fit a pocket watch? This reasoning prevailed, and they went back to work.

The company sponsored a project at Armour Research Foundation in Chicago to help with the theory and design of the motor. The job was mushrooming now; cramped quarters in the main research department were abandoned and the entire project moved to another building where more space was available and where the security problem was easier to handle.

Now came the real job of miniaturization: At first it appeared that an electronic watch would just be a small edition of the electric clock or motor. This was far from the case. It is fairly easy to design and make an electro-magnet for a clock-size motor when the field coil may be more than an inch long and three-fourths of an inch in diameter, but to reduce the electro-magnet to watch scale is a different problem. The working force of an electro-magnet decreases practically as the square of the dimensions, hence magnetic forces available in a watch-size motor become infinitesimal.

Besides the actual design of the stator and rotor of the motor there were two other very difficult related problems. First, a means was needed for controlling the flow of electrical energy to the motor, and second, a power take-off was needed to drive the hands.

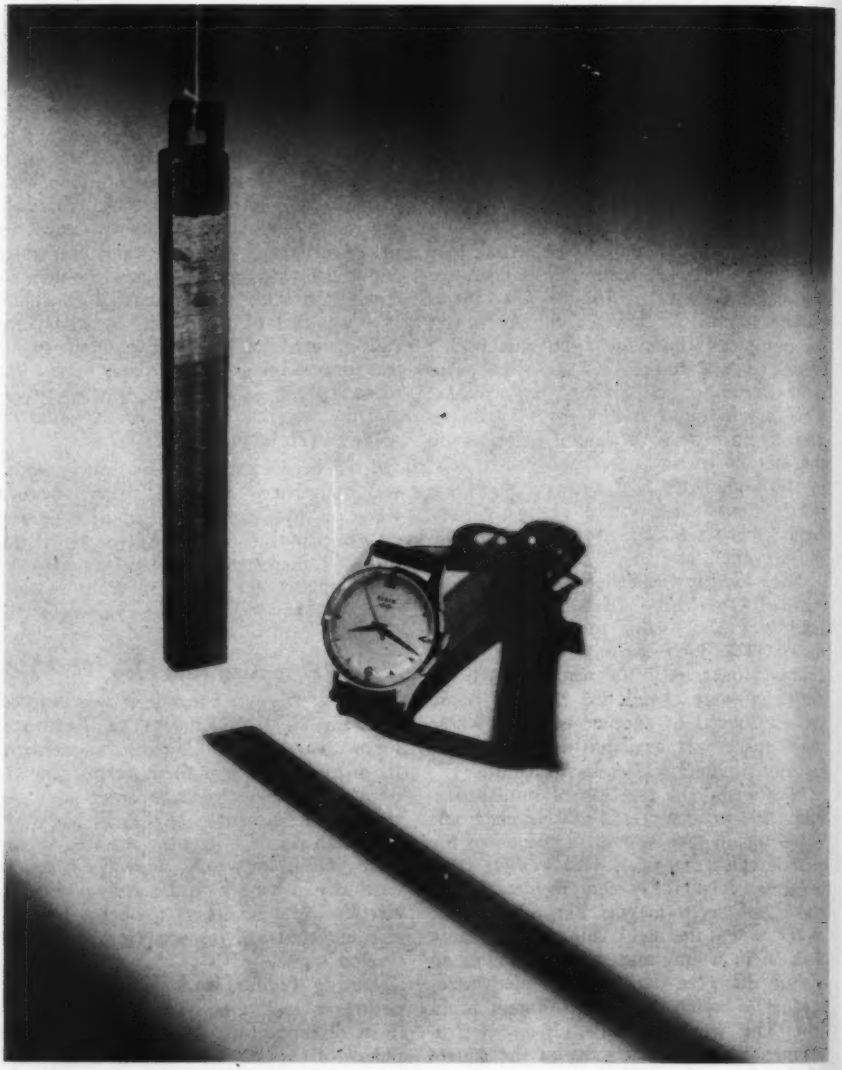
Still another problem was the energy capsule, which must meet a staggering list of requirements. It had to be hermetically sealed, must provide the very maximum stored energy capacity, be completely free from gassing and having a long shelf life. It must provide sufficiently high voltage to operate the watch, must maintain that high voltage at a constant value throughout its life and must have a high current producing capacity. Finally, its elements must be priced within reason and it must be readily manufacturable. An additional problem in connection with the last-named specification was that of developing a satisfactory case material for the capsule. Obviously it was impossible to buy a ready-made unit to meet these requirements, so the capsule and the materials from which it would be made had to be developed.

Even before the first wrist-watch model was completed, new and better models were on the way. Of that first model, Glenn Soper, engineer in charge of the project, comments: "We never want to make another like it. I think it can be said that we did it the hard way, but it did work!"

French Firm Also Had Idea

During Elgin's research it was learned that Lip Watch Company of Besancon, France was also working on the problem. In order to improve their overall knowledge of the field the companies have exchanged information but each has continued to conduct its own research separately. The Lip watch, announced simultaneously in Paris with the news of Elgin's electronic watch, differs in many mechanical and electrical respects from the Elgin version.

During Elgin's work hundreds of experiments and tests were made, most of them disappointing. This held true in all phases of the job—the motor, energy capsule, electrical control system and power takeoff. One major reason was that work in this hitherto unexplored field of microelectronics required a completely new understanding and interpretation of established physical and chemical laws. It was found, for example, that the principles of conventional motor design theory no longer



MIGHTY MITE . . . Tiny magnet holding heavy metal weight played major role in development of Elgin electronic watch. New magnetic materials, with up to 100 times the magnetic capacity of iron, made possible construction of world's smallest practical motor to operate the timepiece. It will run more than a year before aspirin-sized energy capsule needs replacing, and operates at absolutely constant rate.

applied in a motor capable of producing only one-seventy-five millionths of a horsepower.

The present program of testing and evaluating on production models is being continued for an extended period to insure that, once the watch is marketed in quantity, it will be a thoroughly tested and proven timepiece. Meanwhile new manufacturing techniques are being developed to handle certain difficult materials used in the watches.

Horological Implications of the Electronic Watch

Elgin's electronic watch will probably go down in history as the greatest single advance in the science of watchmaking since the mainspring was invented late in the fifteenth century. The electronic watch embodies a new source of energy to drive the train of gears; ultimately this system will probably replace the mainspring which for 450 years has powered every pocket and wrist timepiece.

Mechanical clocks were first known in the twelfth and thirteenth centuries. These early mechanisms were moved by wheels and weights, and they employed a crude system of gears to drive the hands. Mostly they were used in clock towers, such as the Canterbury cathedral clock built in 1292. But these instruments were of limited use due to their size and to their dependence upon gravitational pull on large weights for their source of power. The first step in remedying this trouble came about 1490 with the invention of the mainspring.

The mainspring, in turn, made it possible to compress a timekeeping movement into a portable clock, first built at Nuremberg, Germany, in 1505 by Peter Henlein. Twenty years later Jacob Zech of Prague succeeded in regulating the power of the mainspring by inventing the fusee, a word derived from the Latin for "spindle."

The Nuremberg "egg" came in 1550. This portable clock became the world's first watch, so called because it was carried by the night watchmen of Nuremberg. Its comparatively smooth functioning was aided by brass plates and wheels, which had been introduced twenty years earlier.

In the succeeding years the most notable advances were decorative, such as glass crystals, invented in 1620, and enamel dials, in 1635. The next great step toward greater accuracy came in 1661 when Dr. Robert Hook of England made the first hairspring—a crude device which got its name because it was made of pig's bristle. Not until more than a century later did a Frenchman, Abraham Breguet, invent the over-coiled hairspring.

The hairspring has been characterized as the "brain" of the watch because it controls the rate of oscillation of the balance wheel by energy alternately stored and released, usually five times a second. Its perfection was certainly the most important horological achievement since the invention of the mainspring.

Jeweled bearings came in 1704 and made possible a degree of precision never before known in the science of horology since they provided friction-free pivots for the gears.

Since then the bulk of watchmaking progress has been in the nature of improvements and refinements, developing more precise parts so that watches might be made smaller and might keep better time. Because of this emphasis on precision very little attention was directed to the principles of watch operation or to the problem of simplifying the actual construction of a watch.

Today's conventional timepiece contains approximately 150 parts and is one of the most intricate instruments known to man. Not until Elgin's scientists began recognizing the feasibility of an electronic watch, which would eliminate the mainspring and its associated parts, as well as the winding mechanism, was much simplification of the movement possible.

Four notable advancements in horology have come since the turn of the twentieth century. One of these was the development of highly successful wrist watches, made possible by the tremendous strides in the compression of a watch movement into an ever-smaller area. A second was the almost universal adoption of the system of interchangeable watch parts, a project originated

WEE WATTAGE . . . Electronic watch by Elgin National Watch Company uses so little power from its pill-sized energy capsule that 10 million of the watches could be operated from the power consumed by a single 100-watt light bulb. Tiny motor, smallest practical such unit ever built, runs at absolutely constant rate, providing almost perfect time.

in the U. S. almost 100 years ago and which has made possible a line method of assembling precision watches. It has also standardized and improved quality while lowering the price of watches to the public.

The third achievement was the automatic, self-winding watch, whose mainspring is kept wound by a rotor activated through motion of the watch on the wearer's wrist. Finally, there was the "durapower" mainspring, a recent Elgin development, which practically eliminated the chief cause of watch failure by providing a nonmagnetic, non-corrosive spring guaranteed against breakage.

It is perhaps symbolic of the rapid technological progress of our century that the last two of these developments—the automatic wrist watch and the unbreakable mainspring—will both be superseded by the electronic watch.

Although the automatic watch theoretically relieves its wearer of the responsibility for winding his timepiece, it has the same shortcoming of any other spring-driven watch in not being able to store more than approximately 40 hours of running time. Thus it must be worn every day, invariably, or be wound manually.

Despite the truly amazing gains in providing increased accuracy for spring-driven watches, they cannot measure up to the electronic timepiece in this respect because an energy capsule delivers power at an absolutely constant rate, not for just a few hours, but for many months, until a short time before it expires.

The new development does not mean, however, that mainspring-driven watches are obsolete, nor do they suffer materially by contrast with the electronic watch.

Actually, modern conventional watches are among the most precise instruments ever made. Mainspring-driven watches sometimes keep time to an accuracy of one second per day, which represents an error of only one part in 86,400. By contrast a very fine laboratory meter—larger and much simpler in construction—is normally expected to have an error of about one part in 400. Yet the meter is used only by trained technicians under laboratory conditions, while the watch is subjected to all kinds of treatment in normal usage.

Millions of mainspring-driven watches now in service will therefore continue giving their owners excellent service for years to come, particularly if they are serviced by qualified repairmen. Granted that the electronic watch will keep better time, there is no immediate reason to believe it will replace the excellently performing spring-driven timepiece over night; conventional watches provide a service more excellent than most watch owners will ever need.

Thus the comparative excellence of spring-driven watches, combined with the fact that electronic watches will not generally be available for several years, makes it probable that adoption of the new watch will be a process of slow evolution.

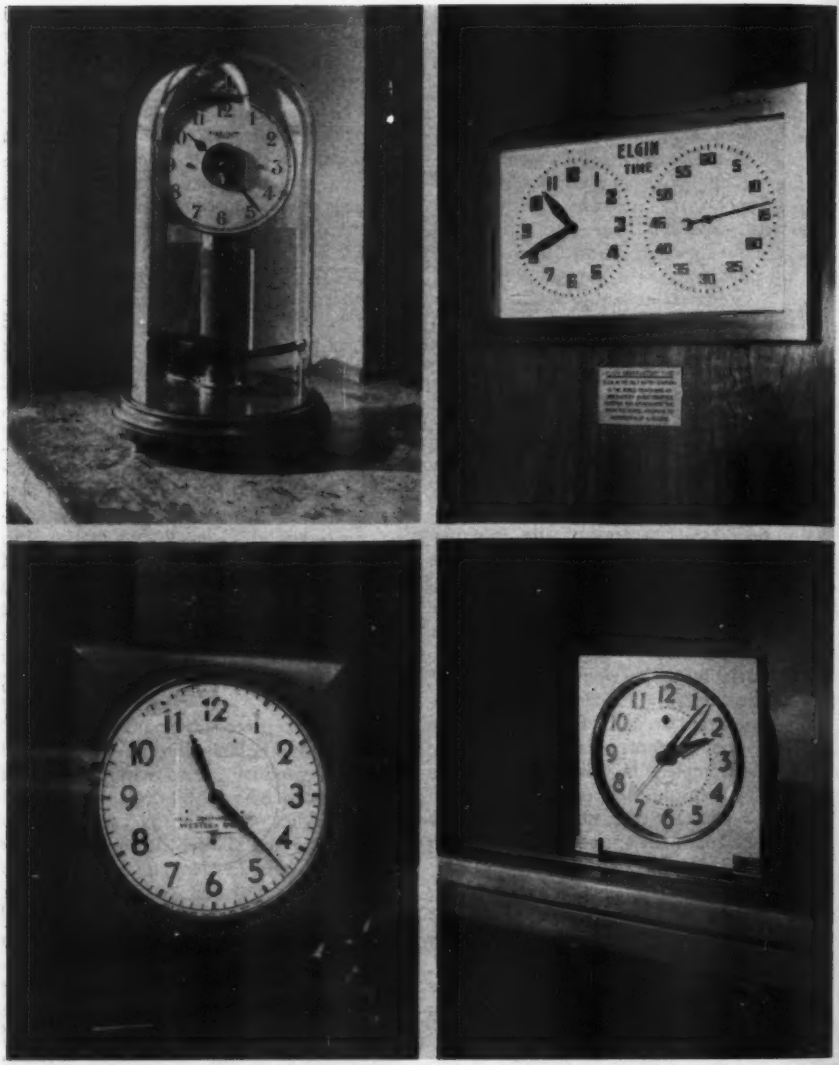
A Brief Discussion Of Primary Batteries

The device which energizes Elgin's electronic watch can properly be called a battery, yet it possesses so many unique characteristics and is so small that it ushers in an entirely new era in the concentration of electrical energy into capsule form. Hence the name "energy capsule". It is the most recent and compact application of principles first demonstrated in practical form by an Italian scientist, Alexander Volta, in 1799.

Volta was preceded by many other scientists and scholars who likewise sought means of producing electricity, one of the most famous being America's own Benjamin Franklin, who in 1752 captured electricity from the skies by means of a kite and stored it in Leyden jars.

As early as 550 B. C. a Grecian scholar, Thales, had observed that amber would attract light objects, if rubbed. Shortly after the birth of Christ, the historian, Plutarch, recorded that iron is sometimes attracted and at other times repelled by the lodestone. Otto von Guericke, a mayor of Magdenburg in the seventeenth century, made an electrical machine consisting of a ball of sulphur and means of rotating it; he generated electricity by rubbing the ball and discovered that electricity could be conducted away by a chain.

One of the most notable pre-Volta developments was the Leyden jar, variously ascribed to Cuneus, Von Kliest and Mussenbroek, the last named being a professor at Leyden, from which the jar took its name. Groups of jars were called batteries.



OLD SCIENCE BROUGHT UP TO DATE . . . Electronic watch developed by Elgin National Watch Company embodies in miniature form several horological and electrical principles known for many years. Four basic types of electrical clocks, shown, are:

Upper left: Example of independent, self-contained timepiece, the Bulle clock which operates from its own battery. With Elgin-type energy capsule this clock now runs from a battery one-thousandth the size of its original battery.

Upper right: Example of "slave" clock, actually only a dial whose hands are moved by impulses from a master mechanical clock.

Lower left: Example of synchronizing or error-correcting clock, a Western Union timepiece which has its own clock works but whose hands are corrected electrically to those of a master clock at regular intervals, hourly or daily.

Lower right: The plug-in type synchronous motor clock used commonly in the home, which runs off a 60-cycle-per-second alternating current.

They did not generate electricity but stored it, being condensers or capacitators. Franklin's experiments were aimed at capturing atmospheric electricity to charge these jars.

As commonly understood, a battery is a device for generating electricity by chemical action. There are two types:

1. *The primary battery,* first constructed by Volta, is usually composed of a number of cells. Production of electricity depends on the interactions between substances in these cells, and the battery expires when this interaction stops or when the active elements have been consumed. Flashlight batteries are an example.

2. *The secondary battery,* also called a storage battery, differs from the primary type in that it can be recharged by passing an electric current through the cells in the reverse direction. Automobile batteries are an example.

Volta constructed what became known as the "voltaic pile." He placed a series of pairs of copper and zinc discs, one above the other, separating each pair from the one above it by a piece of cloth moistened with a solution of common salt. An electrical current, generated by the interaction between the substances, passed through a wire connected to terminal plates at the two ends of the series. The direction of this current is from copper to zinc, the zinc in each cell being the negative and the copper the positive pole.

Through the years that followed, Volta's ingenious but cumbersome battery was rebuilt in more practical form, one of the first being the "trough" battery, devised by William Cruickshank in 1880. Pairs of zinc and copper plates were cemented into grooves within a rectangular trough, and the space between each pair of plates filled with "exciting liquid" or as we say today, electrolyte.

A dry form of the voltaic pile was made in 1812 by Giuseppe Zamboni. It consisted of many discs of silver or gold, separated by paper discs coated on one side with manganese dioxide; the electrolyte was largely dependent on moisture absorbed from the air. Though impractical because it required hundreds or even thousands of discs to supply an infinitesimal amount of current, the principle of the Zamboni pile still interests scientists because of the modern electronic need for compact sources of high potential.

Faraday established a few years later that electricity, whatever its source, is identical in nature, demonstrating that electricity could be produced magnetically. This made possible the transformation of mechanical power into electrical power, but batteries continued to be the principal source of electricity for many years. Nor were batteries improved upon materially for some time, still being subject to the detrimental effects of polarization, local action and the need for frequent cleaning and reconstruction.

But in 1829 Antoine Becquerel built a two-field cell that prevented polarization. One part of the cell contained nitric acid and the other a strong caustic. Six years later an even more practical battery came from John Fredrick Daniell, consisting of a cylindrical rod of zinc immersed in dilute sulphuric acid. Surrounding this was a copper cylinder filled with a saturated solution of copper sulphate. Spent acid was drawn off as required through a funnel, and additional copper sulphate supplied from a "cullender". Hydrogen evolution was prevented and a copper deposit appeared as a pink coating, perpetually renewing the surface of the copper electrode.

Dry Cell Developed 1869

Daniell's cell had tremendous influence. One modification of it, the "gravity cell" introduced in 1854, is still in use. The Marie-Davy cell, of 1859, was similar to the Daniell development, but used a carbon electrode in a paste of mercury sulphate. It was not until 1869 that Georges Leclanche announced the forerunner of our modern dry cell, already well tested because 20,000 of them were in use on railroads and telegraph lines.

Leclanche used coarsely ground manganese dioxide, which he found to possess slight conductivity in addition to being a good oxidizing agent. This he mixed with an equal amount of retort carbon to serve as a depolarizing mix, and placed the substance in a porous earthen jar. This in turn was set in a larger rectangular glass jar which held the zinc electrode and the bulk of the saturated solution of ammonium chloride. To make the cell portable Leclanche covered the top of the depolarizing mix with a layer of wax, punched to per-

WAKMANN WATCH WAYS

Dr. Paracelsus, Wearer of the Magic Sword

by Icko Wakmann

It is 9 o'clock, and I am sitting in my bedroom in the hotel in Geneva. I have traveled all afternoon, I have just completed the entries in my journal, and I look again at the framed engraving on the wall, "Dr. Paracelsus."

How many people today can tell you quick the adventures of the good doctor? It was different when I was a schoolboy. Across 400 years of history, Paracelsus threw a torch to every imagination. He was a celebrated physician. A fearless swordsman. In the handle of Paracelsus' sword crouched a live devil, only five inches tall. Woe to the rascal who offended the fabulous doctor!

But in addition, Paracelsus was an alchemist—one of those early scientists who searched to turn base metals into gold. To the regret of tax collectors the world over, the alchemists never succeeded. Yet it is intriguing to remember that Paracelsus was a Swiss. Is it one of his descendants who has created the Wakmann Skelomatique? It is the **only** automatic wrist watch with transparent back! Elsewhere in this paper, it is described in detail and portrayed in photograph. For profits this spring, you MUST have the Skelomatique.

I am returning with other surprises. With specialty wrist watches for men and women. With watches that will make your windows glow with excitement. With an unusual Incabloc pocket watch, just in time for bridegrooms and graduates. The great Paracelsus never found how to turn base metals into gold. I now show you how to turn **people** into gold. When you read these words, I will be back in America. Write me at once for facts on the **newest** of NEW Wakmann watches!

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mit the escape of gas.

Shortly before 1890 there was great activity in the production of modified cells, all having the primary object of making the electrolyte unspillable. The most successful was that produced by Gassner, about 1888, a cylinder of zinc open at the top, closed at the bottom and varnished on the outside. This served both as a container and an electrode. The other electrode was carbon, and the space between the carbon and zinc was filled with a pasty mixture of zinc oxide, sal ammoniac, plaster of Paris and the necessary amount of water.

This was the first successful dry cell, and its refinements ultimately led researchers into the field of miniaturization.

During World War II the Ruben type cells were used widely in military instrumentation. A battery of 72 series-connected cells powered the "handie-talkie" radio field set, and a somewhat larger group of cells the "walkie-talkie". One of the most important civilian uses of these cells today is in hearing aids.

When Elgin began seeking a source of energy for its electronic watch it was thought the Ruben-type cell would suffice. This judgment proved premature, however, because experience showed that the requirements of a cell for powering a watch were greatly more exacting than those for a hearing aid. The energy capsule, it was found, must meet the following list of specifications:

1. Hermetic seal.
2. Maximum stored energy capacity.
3. Complete freedom from gassing.
4. Long shelf life.
5. Sufficiently high voltage to operate the unit.
6. High current-carrying capacity.
7. Constant voltage throughout its life.
8. Reasonable cost of elements.
9. Feasibility of manufacture.

Thus it became necessary to undertake a research program specifically to solve the battery problem and the result is believed to be the smallest practical power-producing cell ever made. Smaller than a penny in volume, it will operate the motor more than a year. Most important, its voltage remains constant until it is completely discharged.

FJ: How can I determine the right diameter jewel to fit friction tight after reaming the hole?

Answer: For shop practice, the difference of .02 mm. is generally accepted for tight friction fit. However, if it is a large jewel, .03 mm. will be ample, but in the case of a small balance hole jewel, .01 mm. to .015 mm. is safe. We have friction jeweling tools on the market that come complete with reamers that are marked what size hole the reamer will cut. You can then gauge the diameter of the jewel, allowing tolerance for friction, according to the diameter of the jewel. When doing this kind of work, the ordinary slide gauge is not accurate enough, and you should provide yourself with a metric micrometer.

RK: I have a clock wheel with one tooth broken and I want to insert a new tooth, but have been told not to use soft solder to hold in the tooth. What is the objection to soft solder?

Answer: When inserting a tooth in a wheel, cut out a dove-tailed slot in the rim of the wheel a trifle wider than the tooth itself. Take a piece of hard brass stock and fit it to the dove-tail slot. The stock should be a trifle thicker than the wheel and the edges of the dove-tail slot slightly champered. Insert the piece with a ball peen hammer, riveting fast, starting the riveting at the outer edge of the wheel, thus driving the dove-tailed piece into the wheel, making it secure. You may then cut the piece to length or height of tooth, shaping to correspond with the neighboring teeth. Dress off the surplus material on each side, and then you will have a workmanlike job, and the wheel teeth will be as strong and hard as ever. If you use soft solder and heat, you will draw the temper from the brass, leaving it soft, and when the wheel is inserted in the clock there is a possibility that the teeth, being soft, will bend over.

AY: I have a watch that shows good rates in pendant-up and pendant-down position, but when I test it for pendant-right and pendant-left, I find a big difference in the rates. I have poised the balance, and the hairspring is truly circled around the collet and dead flat. The regulator pins are close, and the escapement, as far as I can check, works perfectly. Where might I look for the trouble?

Answer: If you will hold the balance on dead center and observe the spacing in the hairspring coils, you are likely to find that on one side, the spacing is wider than the opposite side. The side where the spacings are wide will show a slow rate compared to the opposite side. This will cause your right and left errors. Correcting the spacing by shaping the overcoil at either elbow will do the trick; however, you must observe when the spring is in action one side will develop more than the opposite side, even though the spaces are correct when the balance is at a standstill. This development

INFORMATION PLEASE

Directed by
W. H. SAMELIUS

Chairman, Science of Horology and Technical Advisory Board

can also be changed by re-shaping the overcoil shorter or longer or by stiffening the bends. These are suggestions that will be helpful.

ROF: I have several old books about watchmaking that I have no use for. What do you suggest that I do with them?

Answer: As you say you have no use for these books, to sell them would not bring very much cash; however, why not present them to your library or to some watchmaking school where the students can have the use of them? This would be a good gesture on your part; the books would be appreciated and put to good use.

TQ: I have a small Swiss watch that has given a lot of trouble, as the stem is continually pulling out of the movement. I have checked and find the stem fits the movement and the set lever finger fits into the slot of the stem. I screwed the lever down tight, but after being used a short time, the customer brought the watch back with the stem pulled out. How can I remedy this trouble?

Answer: As everything seems okay according to your explanation, there is one place you missed. Re-check the job and you will probably find that the shoulder of the set lever screw is below the surface of the plate and you are merely drawing the lever down onto the plate, so that when setting the watch, you loosen the lever from the screw. This shoulder on the set lever screw must extend above the surface of the plate by two or three hundredths millimeter, so that when the screw is drawn tight to the lever it forms a unit. Then when you set the watch, the lever and the screw work in unison and will not work loose.

TID: When sizing a gold band ring, I have trouble cutting the ring because I cannot tell where the old joint is. So after inserting a piece and attempting to solder the new piece in the band, the old joint opens and the small piece in between comes out. How can I detect where the joint is to avoid trouble and loss of time?

Answer: Before cutting the band, heat the band, using a blow pipe. The ring will discolor somewhat, but the joint will show quite clearly. The rule is to use a lower karat solder than the ring proper so that when heating the ring, the lower karat will discolor and show black lines.

THG: I have an old Waltham watch whose age I am curious to know. The plate is numbered 11,825,900.

Answer: According to our records, this watch left Waltham factory about 1900.

WHW: A customer brought in a wooden clock, something entirely different from the clocks made 150 years ago. On the upper end of the rod are two arms that have two weights attached. The arms are notched so the weights can be moved in or out from the center for regulation. On the lower end of the rod are two flags set at 90-degree angles. These flags are motivated by pins in the escape wheel. It has one hand, weight-driven, and has only three wheels in the train. The dial plate is embossed and marked with a likeness of Christopher Columbus, and dated Anno 1492. My customer thinks the clock is very old and valuable. Can you give me any information?

Answer: Many thousands of these clocks were made in this country and sold at the World's Fair held in Chicago in 1893 to commemorate the 400th anniversary of the discovery of America by Christopher Columbus. On examination, you will note that the dial is not hand-carved, but die stamped, and originally the clock sold from $4.00 to $5.00. In many cases the clock has been sold and over-valued, to the disappointment and sorrow of collectors and owners.

PM: In a self-winding watch does the hook end of the mainspring safety go under the free end of the safety? Does the rule apply when the safety is riveted to the mainspring? I was under the impression that the hook end should go over the free end to prevent binding, but I have read otherwise.

Answer: As a rule, the hook is fastened to the slip end spring, leaving no burrs on the outside of the slip end spring to cause any scraping or binding against the walls of the barrel. In the case where the mainspring is riveted to the slip end, it is fastened to the outside of the band, so as not to cause binding as the spring is being wound. In either case, see that the riveting is secure and none of the heading extends beyond the surface of the slip end spring.

TFB: I have had trouble with several automatic watches stopping overnight. I have checked every possible source of trouble, and still one customer says his automatic watch will stop overnight when it lays on the dresser. The person is extremely active, so it cannot be from that source. I have checked the mainspring and

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it is of proper length. Any information you can give me to solve this problem will be appreciated.

Answer: From the above information, the writer would suggest that you check the slip end spring or band. You will probably find that the friction band slips before the mainspring is fully wound, and consequently not storing enough power to run overnight. I suggest you put in a friction band a little stronger, one that will hold the spring until the mainspring is fully wound, and then slip as the winding is continued or the watch is being carried.

JAD: In the February issue there was an article about the identification of watch terms. You state, "Toe—that part of the tooth of a club escape wheel which leaves the stone last. The wheel travels from heel to toe", and "Heel—the locking corner of the club escape wheel tooth".
H. L. Beehler states the opposite and says that the toe is that part that engages the pallet stone when the escapement is locked, and the heel is that corner that last makes contact with a pallet stone.
Why is it that different horologists use different terms in setting up the escapement?

Answer: Your question comes up quite often and is the fruit for argument. If you compare the shape of the tooth to a boot, we might call the front of the tooth the heel, and the toe would be the part that leaves the pallet stone and as the boot-shaped tooth is moving backwards; the heel of the boot would strike the pallet stone first. However, when we are walking, our toe would strike an object first, which, according to the shape of the tooth, is that part of the tooth which leaves the stone last.

Different engineers and designers will reverse the terms, so perhaps to clear things up, a reference note explaining why the tooth has a heel and toe might clear the problem, and perhaps all horologists would come to some definite terms. The heel and toe action was employed in some of our early escapements; that is, when a tooth was passing a pallet stone, the surface of the tooth and the surface of the pallet stone became parallel, and in order to break this parallelism which caused oil adhesion, the toe would lift, breaking the adhesion which caused considerable trouble in our smaller escapements. In today's escapement, they are designed so that at no time during the passing of the tooth does the lifting angle of the tooth and the lifting angle of the pallet become parallel.

OHS: Can you tell me where I can get the mirror in a dresser set replaced? I have calls for this work every so often, but have been unable to find anyone who does this work for the trade.

Answer: If at all possible, return the mirror set direct to the manufacturer, or you may try the North Shore Glass and Mirror Co., 1324 West Morris Street, Chicago.

BT: Occasionally I am called upon to appraise goods purchased at a competitive store. Do you think it is good policy to avoid the issue, or give an estimate of its value, or show the party your line of similar goods, quoting your price and explaining to the party that you are not familiar with the competitor's goods, and therefore can set no price.

Answer: Quoting a price on your competitor's merchandise is not a good policy. It is better not to be familiar about his lines of merchandise or prices. However, if you wish, display your own merchandise for comparison, quoting the quality and price. This will not commit you to any comments about your competitor's merchandise that might be detrimental to yourself and construe a misunderstanding between your competitor, the purchaser, and yourself.

WCP: I have a French traveling clock for repair. It has a platform cylinder escapement. The cylinder is broken and my jobber cannot duplicate the sample. Can you tell me where a new cylinder for this clock may be obtained?

Answer: Cylinder watches and clocks are slowly disappearing from the market, and material for the same is rather scarce, the old stocks being mostly depleted. While I don't think you will be able to procure a cylinder already pivoted, you may obtain a cylinder in the rough; that is, the cylinder itself can be finished, having upper and lower plugs inserted. These plugs are always long enough to cut pivots to the length and size to fit your wants. These cylinders in the rough also have a brass bushing attached so you can cut the bushing down to fit the balance wheel and hairspring collet. It is possible, if you will forward your sample to M. J. Lampert & Sons, 359 Fourth Avenue, New York, they may have some blank cylinders in stock or

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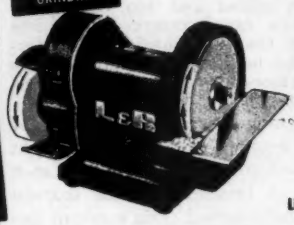

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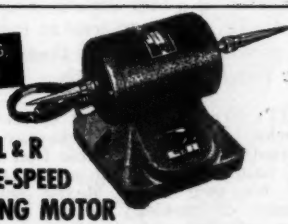

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can import one for you.

CRH: I lately came into possession of quite a quantity of diamond powder. It seems to be mixed and too coarse for polishing. How can I remove the coarse powder from the fine powder? I understand that the boxwood lap charged with very fine diamond powder will remove pit marks and re-polish a cap jewel.

Answer: Diamond powder is graded by settling. Use a small bowl filled with light clock oil. Then stir in the powders. Let it stand about 15 minutes and the coarsest powder will have settled. You may call this powder No. 1. Carefully pour off the oil again into another bowl, leaving the settlings in the first bowl. Allow the second bowl to stand for approximately one hour, then repeat the operation by pouring off the oil again into a third bowl, and let this settle for three or four hours. Repeat the operation, pouring off the oil into another bowl, then you can let the oil stand for six or seven hours. In that way you will have different grades of powder and the last settling will be the fine powder. The time of settling depends on how heavy the oil is, so a little experimenting on your part will give you ideas as to the grade of powder and length of time required for the finest powder to settle.

RHT: From the number of watches and clocks turned out back in say the 1700 period, it seems incredible that they were all handmade, or that each maker made all his own tools. Maybe the general reader of horology is not interested in how actual manufacture was done in 1700, but I am. For instance, how was a fusee chain made in 1700, where each link and pin is perfect in shape and size, and tempered to a certain hardness? Also, how was the spiral groove cut in the fusee to obtain the exact advancement both directions in the groove? How about the cutting of a cylinder escape wheel in the 1700s so that each tooth is perfect in size and shape and standing on a pillar? Turning to modern times, I have often wondered how watch factories make the screws of watches so they are bright and clean in the threads. Are they cut from tempered rod or hardened after making them, and then cleaned? The question can also apply to watch pinions. You had an article in April and May, 1950, about modern designs of watch gears, but nothing about how to actually produce a gear or pinion, and how to shape cutters to make gears and pinions. Maybe I am asking for information on trade secrets. Anyhow, I also wonder what has happened to all the tools used in the past. Are they in museums or are they non-existent?

Answer: Referring to the first question, we have no actual records of the number of watch and clockmakers who actually built the complete watch and clock. It seems that watch and clock work were more or less specialized as to the various units; that is, one workman, possibly having his own shop, would specialize in turning out plates; another workman would specialize in building balance bridges and piercing them. Some would make dials only, others would make hands, and so on throughout the movement, all being handmade. Some shops would buy semi-finished material and assemble the complete watch. Clock parts were also made semi-finished. Many watchmakers conducting their own business would have these parts assembled and when completed, have their name and city engraved on the plates, giving the impression that they built the watch.

Referring to fusee chains, these were made individually by individuals who specialized on chains only. Beyond question, the links were all punched out with a punch and die and pierced, possibly not with a punch press but with a pair of pliers equipped with a punch and die similar to our mainspring hole-punching pliers. From there on, the links were all assembled by hand, and each link was riveted. When the riveting was completed, the chain was stretched on a flat surface and what riveting projected above the links was stoned off and the links were polished. Your writer has never heard just how the tempering was accomplished, but I am under the impression that the links were punched from sheet steel that had been hardened and tempered. However, it may have been after punching the links from soft steel, they were put into a small cast iron container of charcoal powder and capped at either end. Then the container would be heated to a cherry red and quenched in water. This procedure would harden the links. After that, they probably re-heated the container to a blue heat, giving the links a spring temper.

As to cutting the spiral groove in the fusee, this was done in a lathe. First the fusee was cut to shape and then with a threading tool, the groove was cut, but the tool would

be guided by the template, so as the work revolved, the tool would be carried forward similar to our thread-cutting lathes. The shape of the groove was determined by the strength of the mainspring, as in early days mainsprings varied considerably from the fully wound to the run-down position. To determine the proper shape or incline of the fusee, a testing bar was attached to the mainspring arbor. This adjusting bar had a sliding weight, and as each turn of the mainspring was taken, the weight would be moved away from center or towards center to get the testing bar to balance the force of the spring. Thus they could tell from the different stations of the weight on the testing bar what curve or how steep the incline on the fusee must be in order to equalize the torque of the spring over the pull on the fusee.

The cylinder escape wheel was quite a work of art. First a blank would be cut, or we might call it a shell. This shell would have a flat rim sufficiently wide for the width of the cylinder escape wheel tooth. Cutting into the shell, removing material, they would have clearance for the cylinder, and again cutting for the shape of the tooth, they would have space for the cylinder. In those days wheel cutting was done with a fiddle bow lathe, and in later years, a foot wheel was resorted to for continuous motion.

You asked what has happened to the old tools. Like many of our modern tools, they seem to be laid away and finally end up in the scrap pile. However, you will find that a few of these old tools are still in existence. Your writer was very fortunate in having a collection of tools presented to him. They were used by a Mr. Proctor in Chicago, who died at the age of 90. The tools were presented to me in 1920, and among them were some of the most beautiful small lathes wheel-cutting engines that I have ever seen, most of them being handmade for special work. Mr. Proctor in his early days apprenticed in England, then worked in Switzerland, Germany and France, and procured these tools throughout his travels. He finally came to America and after arriving here, found that with modern machinery, materials could be had ready made, so he procured an American lathe and stored away his entire collection of tools used in his early days of watch

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work. A few years before he died he paid me a visit and told me about these tools that were laying under the counter rusting. He felt that when he died they would be useless and would probably end up in the scrap heap. He asked if I would accept them and see that they were taken care of. He valued the collection at $5,000. I, in turn, cleaned the tools and presented them to the Smithsonian Institute in Washington, D. C., where they are now stored and will be perpetuated. I only wish other old watchmakers would do likewise.

The modern way of making watch screws is entirely different. They are made in automatic screw machines from soft steel, being threaded and slotted complete as they come from the machine. They are then hardened in cast iron boxes, the heat being controlled with a pyrometer and a muffle furnace is used. They are then drawn to a blue color by a fixed degree of heat. As they have not come in contact with air, they remain white. After that, the screwhead is finished flat. The screws are then inserted into a template by the thousands, and the entire lot is lapped flat and polished. Watch gears are created first from a large drawing; from the drawing a template is made, the template being quite large. Then by means of a pantagraph, after the blank cutter is put in the lathe and running, the cutting tool is guided so the cutter being made will have the exact curve of the template. This template is laid out from drawings, and in this way, perfect gearing is obtained.

Here is a comment from HWD concerning the removal of mainsprings from the barrel:

I have been reading Information Please in the American Horologist and Jeweler with a great deal of interest, and I find it very helpful and interesting. I have been doing watch and clock repairing for a good many years, and I suppose I have handled about every make of model and size watch, but still I don't know everything. I can't refrain from commenting on your article in the December, 1951 issue, Page 58, and evidently referred to in the February issue of A. H. & J. by the correspondent who says to not clean the mainspring.

I am rather inclined to think you are correct in that the spring should be cleaned and oiled. I should like to ask the gentleman who does not clean the spring, just why clean any of the watch? If it is good to clean a part, why not clean it all? I have heard men brag about their watches, saying they had had a watch for five years and never had a thing done to it and it still ran. But when you go into it, you find that it is worn so badly and in such a condition that it would be about as cheap to get a new watch as to pay for having that one put in shape again.

So I say again, clean it all and do a good job for the customer or do nothing at all. I always clean the entire watch inside and out, and have very few come-backs.

Answers to Questions Appearing in February Issue:

1. The gimbals are so constructed that the chronometer movement and case which holds the movement are free to swing in any direction. As the ship rolls or pitches, the chronometer will find its own level. The chronometer is only run in one position, dial up, and if it were not for the gimbals, the instrument would be tilted as the vessel rocked, which would cause considerable side friction to the pivots.

2. In high grade watches that are rated to dial and pendant positions, the olive-hole jewel is employed. The object of an olive-hole jewel is that there is a very narrow bearing surface at the center of the jewel. This narrow surface has the same area of bearing surface equal to the end of the balance pivot. By this means, the end friction and side friction of the balance pivots are equaled.

3. The object of having a flat balance jewel and the convex cap jewel is to cause capillary attraction, drawing the oil and holding the oil about the balance pivots. In either case, if the balance hole jewel is convex, the cap jewel can be flat when the same capillary attraction is obtained.

4. A pendulum 39.14 inches long will oscillate one swing per second, however, if this same pendulum was used at the North pole, it would probably be 39.20 inches long, as gravity is stronger at the poles. If the pendulum was employed at the equator, it would be somewhat shorter, as gravity is not as strong at the equator.

5. All railroad watches are required to be of the lever set type as there is no possible chance of the hands being moved or disarranged while the railroad man is carrying the watch. In the case of a pendant set watch, there are possibilities that the stem might be pulled out by some accident, changing the time of the watch, confusing the engineer and maybe cause an accident. During the early days some wrecks were attributed to pendant set watches that had become in setting position, moving the hands.

6. In a case where a cannon pinion has been lost and to determine the number of leaves cannon pinion is to have, multiply teeth in minute wheel by number of teeth in hour wheel and divide by number of leaves in the minute pinion X 12. Your answer will be 9. Thus: $\frac{27 \times 32}{8 \times 12} = 9$ leaves for cannon pinion.

Proof: $\frac{27 \times 32}{8 \times 9} = 12$ revolutions of cannon pinion to one revolution of hour wheel.

7. To close the socket in a second hand, a good method is to insert the socket into a wire chuck and by means of the spindle, close the chuck. This will close the hole in the socket, leaving the hole straight with a tight fit.

8. As the mainspring gives 8 turns, there will be 8 x the number of teeth in the barrel passing the center line, and if the pinion has 9 leaves, the center wheel would make as many revolutions or run as many hours as 9 is contained into the sum of $\frac{8 \times 63}{9}$ or 56 hours.

9. In the one-day watch or clock, the mainspring drives directly into the center pinion, but in the eight-day watch or clock, there is an intermediate wheel between the barrel and center pinion. By this means the gear ratio is increased so the watch or clock will run 8 or more days.

10. The average 400-day clock employs a pendulum suspended on a fine spring, and is so constructed as to cause the pendulum to make 8 swings per minute.

Answers to Questions Appearing in March Issue:

1. In all our early watches, stop works

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were employed. The reason for employing the stop works was to avoid the last part of the run where the mainspring had the least power and at the top of the wind when the mainspring power was the greatest. Most of these mainsprings would give about six and one-half turns of power and when setting up the stop works, which would yield five turns, it was customary to set up the spring one full turn, then apply the stop works, which would permit five more turns, leaving one half turn which was the strongest and not desirable. By using stop works we could use that part of the spring that gave the most equal power. The advantage of the stop works is also to relieve the strain on the train wheels as the stop works would only permit five turns, blocking the winding mechanism; where in a watch without stop works, the mainspring can be wound to its full extent, putting strain on the train wheels. However, to relieve this strain in our modern watch, the recoil click is employed. The stop works also prevents to a great extent, the forcing of lubrication out from between mainspring coils.

2. Accepted temperature range for adjusting our pocket watches is from 45 to 95 degrees F.

3. A Montgomery dial was a favorite dial for the railroad watch. Instead of the minute numerals laying radial towards center, these minute numerals were all perpendicular, making it easy to read time to the minute. Mr. Montgomery received a patent on this dial, and for many years received a royalty for every Montgomery dial used on railroad watches or any watch.

4. If the roller jewel is leaning forward, it means that the banking pins or screws would have to be opened up, allowing more angular motion to the lever, which in turn would allow more slide in the escapement, which would have effect on the motion of the balance.

5. If a traveler leaves Chicago at 7:27:31 a. m. and arrives at his destination at 4:11:21 p. m., he will have spent 8 hours, 43 minutes and 50 seconds on the road.

6. A long lever would reach too far in towards the roller jewel, consequently to get the roller jewel to pass through, the banking pins or screws would have to be opened, which in turn would create too much slide or a deep escapement, which in turn would cut down the balance arc.

7. At one bell, it could be 12:30, 4:30 or 8:30 a. m. or p. m. Three bells would be 1:30, 5:30 or 9:30 a. m. or p. m. Six bells would be 3, 7 or 11 a. m. or p. m. Eight bells, 12, 4 or 8 a. m. or p. m.

8. A slow train watch: The balance makes 14,400 vibrations. Medium train: 16,200. Quick train: 18,000. Fast train: 19,800.

9. A steel escape wheel is preferable because it can be made thinner and lighter and still retain strength.

10. If a small weight is added to the upper half of the pendulum bob, the clock will gain time as the center of the mass of weight has been raised.

BOOK REVIEW

New Swiss Chronograph Instruction Book

A new 30-page book titled, "Introductory Course on Chronographs" has been published by Ebauches S. A. and is now on sale in the United States.

This new technical guide, prepared in collaboration with the Swiss factories in which the special feature timepieces are produced, cover the following types of basic movements:

1—Recording Chronograph with pillar wheel.

2—Recording Chronograph without pillar wheel.

3—Recording Chronograph, split second, sport watch.

The profusely illustrated publication completely covers all technical features of the three types of basic chronographs.

In announcing the availability of this new book, Paul Tschudin, director of the Watchmakers of Switzerland Information Center, pointed out that chronograph sales have been showing a consistent increase in this country.

"A quality watch is only as good as the service that stands behind it," he stated. "This book has been produced as a tool to help in the servicing of jeweled-lever chronographs, and we feel certain that it will prove an invaluable aid to the watchmaker at the bench."

"Introductory Course on Chronographs" can be purchased at $2.50 a copy from the A. H. & J. book department.

Edwin B. Burt

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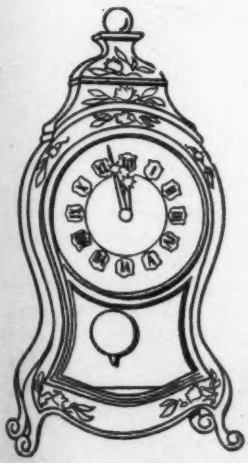

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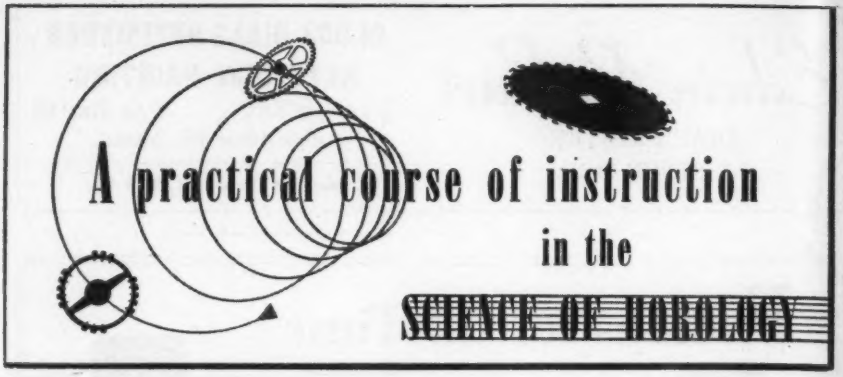


By Orville R. Hagans and D. L. Thompson

WATCH REPAIRING — LESSON 25

(Continued from March, 1952)

Circling:

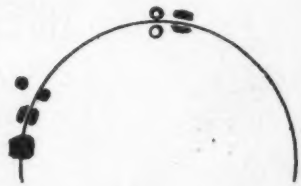
Condition—Reg arc moved by outer pin during full sweep.

Correction—Regulator to slow. T near stud and move overcoil toward staff.

Condition—Reg arc moved by inner pin for full sweep.

Correction—Regulator to slow.

Grasp Reg Arc near stud move away from staff.



Condition—Regulator arc moved alternately by inner or outer pin during sweep.

Correction—Regulator to slow.

Bend near stud to position spring between pins. Advance regulator until spring again is moved. Move regulator back until spring is just in center of pins. Outside the regulator pins use tweezers to correct. Repeat for full sweep of regulator.

(Continued Next Month)

Homemade Demagnetizer

By A. Purchen, F. B. H. I.
London, England

A DEMAGNETIZER depends on a supply of alternating current and this is easily obtained from the domestic lighting or power supply which is usually 100 or 200 volts.

If a coil of insulated wire is wound around a piece of iron, there being a number of turns of wire in this coil, and an electric current from a battery is applied to the two ends of the coil, the iron center becomes a powerful magnet, with a North pole at one end and a South pole at the other, and if the iron center is removed the coil still remains a magnet although not so powerful, so long as the electric current is passing through it.

The current from the battery is known as Direct Current (D.C.) as one end of the battery is always positive (+) and the other end is negative (—) and whilst the coil is fed from the battery, one end of the coil will always have a N-pole and the other a S-pole.

Alternating current is the same electricity but by means of special generators the polarity changes rapidly positive to negative many times a second, depending on the frequency of the generator and this is usually 50 times a second.

If therefore this alternating current were applied to our coil of wire, the magnetism would be changing as rapidly as the frequency and we would have the N-pole of the magnet becoming a S-pole then changing back to a N-pole and so on as long as the current was applied to the coil.

It is not necessary or desirable for our demagnetizer to have the full mains voltage going through it so the first thing we have to buy is a mains bell transformer which transforms the high mains voltage down to a safe voltage to handle.

These transformers are very cheap and can be bought in any shop dealing with electrical goods.

At one end of the transformer will be found two connections marked 200-250 volts 40-60, this is the mains end, and you

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Asst. #C-828 (69 doz. 1 ea. #).....$276.00

Assortments with 6 Drawer all-steel cabinet $12.00 extra.

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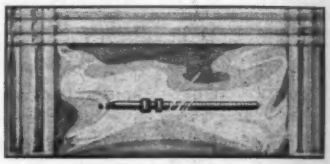

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connect a piece of flex wire with a suitable socket to fit your electric light or power socket. See that your connections are well made and well insulated.

The other end of the transformer will be marked 3-5-8 volts, 1 amp. and you connect another piece of flex across the 8-volt output connections which is perfectly safe to handle and is ample to work your demagnetizer.

Obtain an old electric bell and remove one of the bobbins, but see that it has the wiring intact and that the two ends of the coil are not broken. Mount the bobbin upright on a piece of wood together with the transformer and connect the flex from the 8-volt end to the two ends of the wiring of the bell bobbin. Carefully insulate your connections with insulating tape and see that no bare wires touch.

If you now plug into the electric light socket or power plug, and hold a pair of tweezers about an inch above the bobbin, the tweezers will vibrate in your fingers, showing that your demagnetizer is working. Move the tweezers away slowly from the bobbin and when about eighteen inches away, you can switch off the current. You now have a powerful and cheap demagnetizer which will do everything you require and will cost you next to nothing to run.

A great improvement on this arrangement is to obtain a cardboard or paxoline tube about 2 inches diameter by 1 inch wide. Take two more pieces of stout cardboard and cut out two circles about 3 inches diameter with a center hole 2 inches diameter to fit tightly over the tube. Now place the circles at each end of the tube and glue down so that you have a bobbin with a hole 2 inches by 1 inch long.

When dry, wind on to the tube 150 turns of 28 gauge insulated enameled wire and bring out the commencing and ending wires to a pair of terminals. Tape down the coil so that the wires you have wound on do not come away and if you like give the whole lot a coating of paint.

If you now connect the flex from the 8-volt end of your transformer to the coil you will have a demagnetizer into which a whole watch can be placed, and if withdrawn slowly will be completely demagnetized.

The small bobbin is a more powerful demagnetizer and is very handy when a magnetized piece of steel requires more treatment than the larger instrument can give it and is particularly handy for those hairsprings which do not seem to lose their magnetism. In the case of a hairspring which will not demagnetize, take a small glass vial such as is used for jewels, fill it with clock oil and drop the hairspring in. Hold it over the smaller demagnetizer and then slowly withdraw the vial, when on cleaning the hairspring in benzine, it will be found that it is completely demagnetized.

To test for residual magnetism in a steel part, take a seconds hand which you know is not magnetized, suspend it by a piece of cotton from a peg and approach it with the suspected magnetized part. It will be attracted to it immediately if there is any magnetism left in it.

(Ed. Note: Usual voltages in the U. S. are 110 and 220, with a prevailing cycle of 60. However, the type of demagnetizer described here works equally well on 50 or 60 cycles.)

Watch Stem Setter and Winder Invention

Patented Sept. 11, 1951. Tool for watchmakers for setting and winding a watch stem when watch is out of its case. A cylindrical body has an axial bore with a rod slidable therein. The rod has a knob at end urged inwardly of the body by a spring. A handle at other end of rod has a reduced portion which is slidable in the body. The knob may be projected out of the bore in the head of the cylindrical body for snap engagement with the socket of a watch stem and then allowed to retract so that the head will slip over the end of the stem and lockingly retain the knob in the socketed end of stem. The tool is rotated to wind the stem and set the hands. (Owner) James H. Ruther. Correspondence to Smith & Tuck, 734 Central Building, Seattle 4, Wash.

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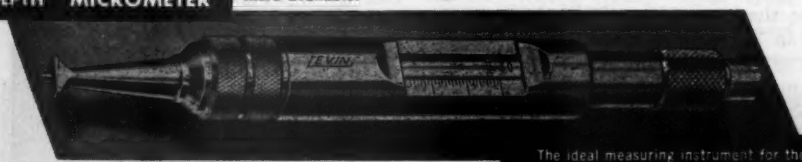

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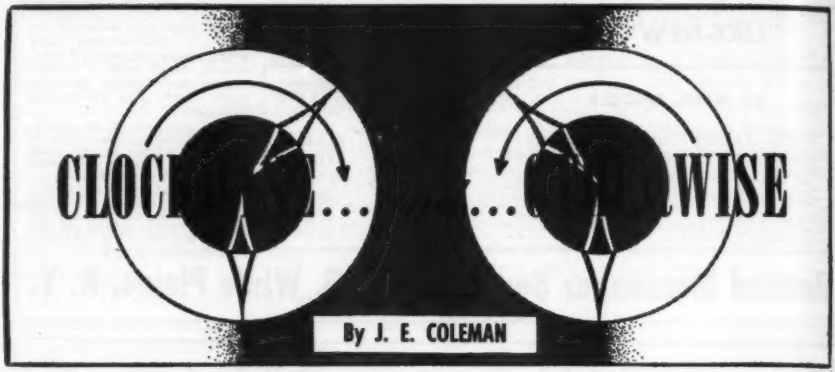

OTHERWISE

In a long distance phone call just completed, Mr. Byron G. Sweazey, (North American Watch Tool & Supply Co., 2018 West North Ave., Chicago 47, Ill.) tells me that C. & O. may announce the reprinting of Ward L. Goodrich's, "The Watchmakers' Lathe, Its Use and Abuse".

Publication date has been set for May 15. Unlike the reprinting of "The Modern Clock", this volume will not be from the original plates; it will be completely reset, and slightly abridged in the last two chapters. These variables make it impossible to announce the exact price at this early date —however it will be between $4.00 and $5.00, approximately 250 pages, and over 275 illustrations; binding to be the same as "The Modern Clock".

The first edition was published by Hazlitt & Walker (Chicago) in 1903, just 45 years after Mr. Charles S. Mosley invented the modern split-chuck (1858). One can almost say that the lathe, as the watch repairman knows it today, together with its attachments was developed during that 45-year period. An examination of this volume showed that its entire subject matter, drawings and instructions were so basic that it is as applicable today as it was in 1903. It has long been out of print and the trade is indebted to Mr. Sweazey for making it available again.

Long, long ago, some wise sage coined the saying that "the proof of the pudding is the eating thereof"—from that even a "clockmaker" can deduct that the fellow who eats the most pudding has the most proof. After talking with Mr. Sweazey about this project last fall, I began to check into the record of the first publication. A quarter-page advertisement was found in the January issue of The American Jeweler for 1908; it consisted of three brief review-recommendations by three prominent men of the trade, Mr. J. H. Purdy, of J. H. Purdy & Co., (then 126-130 State St., Chicago, one of the largest material houses); Mr. H. E. Duncan, superintendent of the Adjusting department, Waltham Watch Co., and later their technical missionary; and Mr. John J. Bowman, director of the Bowman Technical School. In his portion, Mr. Bowman said: "I have looked over a copy of 'The Watchmaker's Lathe: Its Use and Abuse', and I believe it fills a very useful place in the list of books which are of help to the watchmaker. The subject is treated thoroughly and interestingly. Many things concerning tools which are but vaguely understood by the majority of watchmakers will be rendered clear by its perusal".

What could be better proof than from a man who has been literally gnawing at the pudding for 43 years—so—a letter to friend Bowman, and, as always, comes a prompt, cheerful reply:

Dear Mr. Coleman:

I was really made happy to hear from you

Mr. Coleman invites your questions. If your question requires a direct answer, please enclose a self-addressed, stamped envelope. It is impossible through correspondence to give valuations of antique timepieces. questions of this nature cannot be answered.

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BURTON M. REID SONS INC.
1st and Washington "The House of Friendly Service" Springfield, Illinois

that Ward L. Goodrich's book "The Watchmaker's Lathe" is being made available again to American watchmakers, through a reprinted edition. I recall having written a comment or review of this book for the original publishers, Hazlitt & Walker, Chicago, about 40 years ago. I was highly impressed at that time with the unique value of the book to watchmakers and students; and after the last copies available had been sold out and the book went out of the market, I felt that that was a distinct loss to young men learning watchmaking, and have tried since to persuade publishers to reprint the book for the help it could give members of our craft.

In saying that this book is of value to young men or students, I should not be misunderstood as to older and experienced watchmakers, most of whom could get good advice and information from it, about the lathe and attachments that are so important in their daily work.

Sincerely yours,
JOHN J. BOWMAN.

Table of Contents: Chapter I, History of The Lathe; II, Construction of the Watchmaker's Lathe; III, Use of the Split Chuck; IIII, Face Plate and Large Chucks; V, Cement Chucks and Cement Work; VI, Chucks for Special Purposes; VII, Hand Rests and Slide Rests; VIII, Forms of Tailstocks and Their Uses; IX, Cutters, Drills and How to Make Them; X, Turning With The Graves and Slide Rest; XI, Grinding, Polishing, Snailing and Damaschening; XII, Multiple Edged Tools for Continuous Cutting; XIII, Wheel Cutting Attachments; XIV, Turning and Pivoting With The Steady Rest; XV, Idler Pulleys and Belts; XVI, Counter Shaft, Foot Wheels and Motors.

Despite the fact we haven't been able to determine whether or not "Ward L. Goodrich" was the pen name used by Mr. Charles Walker, there can be no question that the writer was a practical bench mechanic; as in all his writings it is self-evident the chief aim is the practical. "The Watchmaker's Lathe" will be obtainable through A. H. & J. book department.

* * *

This month your column was privileged to forward to the United Horological Association (Denver) and The National Association of Watch & Clock Collectors (Philadelphia) for their respective libraries a little catalog issued by Nels Johnson, tower clock builder of Manistee, Michigan, in 1894. These were a gift from his daughter, Mrs. Katie Shannabrook, of Los Angeles. We suggested these libraries, as well as pointing out the fact such "source material" should be made available for future research, etc. A suggestion I'm going to repeat here for all our readers—there must be a vast quantity of material, even magazines, catalogs etc., with direct bearing upon our watch and clock development floating about the country; singly and unknown, their value (and I'm not overlooking sentiment) cannot be very great. Brought together, catalogued in a library such as that maintained by our own UHA of A., each piece would form a vital link in the whole chain and would be forever available for researchers.

* * *

Nice letter from Mr. R. R. Thibault of Small Tool and Instrument Co., Mascoma Bank Building, Lebanon, N. H., enclosing a very practical little "scriber" with protecting cap, and a punch they are manufacturing for use on the Sessions clock motor. We've used a similar "homemade" punch along this line for quite some time—believe it was mentioned back in the article on Alemite and servicing these motors:

Dear Mr. Coleman:

Enclosed is a punch which we designed and manufactured, called Sessions rotor center punch, used to remove and replace the rotor of the Sessions clock motors.

As you will note, the end of the punch serves as a guide while removing and replacing the rotor and shaft. You will also note that the guide fits into the hole on the end of the worm gear and the shoulder stops at the right depth. This punch is made out of tool steel under rigid inspection in the same manner as the finest staking set punches are made; however, as you can see, the shank has been knurled to insure a good grip while in use.

We have often come across Sessions clocks which have been improperly repaired. Upon examination it has been found that the worm in the rotor shaft has been flattened, and in most cases driven into the shaft too far. This causes the flattened part of the worm to bind on the fiber wheel of the first shaft, resulting in a clock that has a tendency to run erratically.

This punch retails for 40 cents and may be ordered directly from us. It comes complete with mimeographed instructions. Please advise us as to your personal opinion of this tool; we are always open to suggestions. We are also enclosing a scriber, which we designed and manufactured. This scriber is being sold exclusively by Swartchild and Co., and may be ordered at any of their offices.

Very truly yours,
R. R. THIBAULT

* * *

Mr. H. Kendall-Torry, technical director,

St. Loyes College, Exeter, England, caught our late difficulty with the Carpano address and sends a corrected address:

Dear Mr. Coleman:

I noticed in your December, 1951, issue that there is some doubt in regard to the address of Carpano & Pons. I am sure you will be interested to know that I wrote to this firm and obtained the books you describe. The address is: Carpano & Pons, Siege Social a Cluses (Hte-Savoie), France.

I am also interested in the rust problem presented by Mr. Grenville Cartis, 25 North Water Street, Nantuckett Island, Mass. I find the best results can be obtained by boiling all the parts of the watch, including the case if necessary, in clean water, and plenty of it to absorb the salt, shaking out the hot water; this should leave the movement fairly dry and it can be cleaned in the ordinary way—preferably by brushing. The hairspring can be treated this way and then rinsed in alcohol and dried in warm box-dust.

For your information, the College workshops specialize in all kinds of wheel and pinion cutting, including watch barrels, winding wheels, etc., and can usually return them within 14 days by airmail.

I and the instructors and students read your journal and find it of much interest. With kind regards,

Yours truly,
H. KENDALL-TORREY, F.B.H.I.
Technical Director

* * *

Mr. A. B. Meyer, watchmaker of Frankenmuth, Mich., cooperates by sending a card to Mr. Sam Rodick, for the source of 6-volt auto clock material, and a letter for the file. As many are interested in this material we'll just give the complete letter:

Dear Mr. Coleman:

Just a line to let you know that Borg staffs and jewels may be obtained from the Empire Clock Co., 93 East Fifth Ave., St. Paul, Minn., also Jaeger, New Haven and Westclox auto parts. I have dropped Mr. Sam Rodick a card also. I even received a new minute hand for a Borg Olds auto clock from them.

I really like your column. Keep it going.

Sincerely,
A. B. MEYER

* * *

Friend Lin Lewis, (Weatherford, Okla.) may be slow on correspondence, but he is okay on long distance phone calls and double okay on co-operation; he suggested and volunteers to make up some slides on clock repairing; you can bet we arose to that challenge quickly.

It will require time, work and more time; your C. & O. will keep you informed from time to time as to the progress of the project. While the idea is just now in the

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"hatching" stage, it is pretty certain that this will take the form of 35 mm. slides to be accompanied by sufficient and appropriate text data for a guild meeting. When completed they will be added to the vast store of similar material now in the United Horological Association library, and will be available in exactly the same way program material is now handled.

We are open to suggestions—how about a few cards? Letters would be better. Present day clock repairing is a pretty broad subject, and this project, of necessity, will have to treat one—two at the most—phases at a time. The question is, "where to begin."

Horological work, and clock repairing in particular, has undergone quite some change within the past decade or two. Basic principles of mechanical operations have scarcely changed at all; most of those changes have been occasioned by more and better tools—a better and quicker method of doing the "same thing." The big change is economical; in the "gay nineties" Mrs. John Doe purchased a little mantel striking clock, possibly a 30-hour movement in rosewood case, for about $5.00. If and when it needed servicing, her "silversmith" did it for $1.00 and in many instances, less. Today, her granddaughter discovers it in the attic or buys it at an antique auction for $10.00 to $20.00, pays a cabinetmaker a fee greater than the original cost of the piece just to remove a couple of coats of varnish from the case. Then to the clockmaker, who for from $10.00 to $25.00, supplies the missing pendulum rod and ball, a couple of new mainsprings, some new bushings and possibly a dial refinish.

The young watchmaker of today, I find, does not have a very clear conception of what repairing was like fifty years ago. In those days the watchmaker was supposed to do just about everything from playing a French horn to milking a cow. A check of the advertisements is positive proof—he was supposed to do engraving, repair jewelry, examine eyes and fit glasses, open the store at 6 a. m., sweep out, and wait on customers between jobs.

In the very beginning, the watch and clockmaker sold timepieces because he made them. Came the factory and factory methods, and the sale of timepieces passed into the hands of "merchants"—many of our oldest stores were founded by mechanics and around the repair bench—it was quite logical to buy one's timepiece from the repairman, from one who understood its workings. Merchandising expanded and grew, the store outgrew the repair bench, and the saddest day for repairing began. At the turn of the century the repair bench, former backbone of the business, became just a "necessary evil."

From my early apprenticeship days, I recall quite clearly an old fellow who poked his head barely within the door and asked: "Is this a silversmith's shop?" On being told that it was, he then asked: "Do you fix specs?" Again the answer was yes. Then and only then did he walk in, and pulling a big silverine turnip out of his pocket, he stated that he "wanted to get his watch swept-out and greased." A true happening—it is not related for the "pun", but rather it is a pretty accurate gauge of what the public thought of the watchmaker, a test as it were; if he could locate a silversmith who fitted glasses then he had the proper man to service his watch.

It was about this era that clock repairing sank to its lowest point. Checking some old repair books, I find that they did not bother to record clock repair jobs at all. The truth of the matter is, there was very little of it. Many one-day weight clocks were in use. When a cord broke, the owner put in a new one himself—much "feathering" (dipping a feather in oil and oiling the clock) and home "tinkering" kept the family clock in operation. If and when one did reach the jewelry store, unless there was something radically amiss, like a broken mainspring, chances were it was given to the porter who removed the works from the case and doused them a couple of times in a bucket of dirty gasoline; many were adept enough to remove the verge, wind the clock, then allow it to lay in the gas until it ran down—a little oil after it had dried, and they called it a "cleaning" job—price fifty cents.

Is it any wonder that the watchmaker of the early 1900s shied away from clocks, or that he saw to it that all of the apprentice's attention was directed towards

watches, jewelry and glasses?

Today the picture is quite different. Fitting "specs" has passed on to the optometrist, engraving is sent out to the engraver, and the jewelry repair to a jeweler. The horologist was left with only watches, as clocks had never been taken up, at least seriously, by him.

Since World War I, clock repairing has been decidedly on the increase—more clocks are in use, more and better clocks are being sold, and the present tempo requires better service from them. In addition, the antique is rapidly climbing into prominence, and I seriously doubt that it is anywhere near the peak—usually restoring one of these calls for quite a quantity of labor as well as a higher degree of skill. Fifty years ago 50 cents might not have been the prevailing price but it was quite common. Today $50.00 jobs are not the prevailing jobs, yet they are not uncommon.

* * *

Mr. Thibault broke the stalemate on tools—we haven't had a new one in quite a "spell". Mr. C. G. Smith, of Time Instruments Company, 307 Madison Street, Washington 11, D. C., promised us something on his new mainspring winder quite a while back—there must be some slight hitch as nothing has come through yet.

* * *

A most enjoyable visit from Mr. Jean R. Graef, (N.Y.C. Girard-Perregaux watches) though all too brief. He stopped off as he planed out to Los Angeles and Hawaii. His corporation also markets Angelus clocks, but our common interest is the fine workmanship to be found in original C. Girard-Perregaux watches, of which he has a goodly number. Over the years he has permitted me to disassemble and photograph many of them in detail; we've spotted quite a few over the country and in the past 20 years I've photographed nearly a hundred originals. The late Major Paul Chamberlain showed me the first I ever saw; he made some study, but did not include but one movement in his book, "It's About Time". I have his original sketch and study of that movement and a movement just like it. I was very fortunate in locating Mr. Girard-Perregaux's son in Switzerland, and he supplied much source

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data before his death in April, 1945. Since this story falls within the restrictions I set up for "Stray Bits" (i. e. unpublished and actually authenticated by a member of the family with first-hand knowledge) I hope to do it as a "Stray Bits" article when I can find the time to do it as it should be done.

* * *

Good letter from Norman Luth, Huntington Park, Calif., chairman of the 1952 U.H.A.A. convention committee. Much constructive work is already completed, but the committee is still very active. That it will be a meeting you can't afford to miss is definitely assured. Prospects of having clock manufacturers with us are better than ever.

J. E. C.

CLOCKWISE

Dear Mr. Coleman:

I have a clock in my shop for repair. It is a Barr battery clock and uses what looks like three flashlight batteries. The name on it is, "Barr Mfg. Co., Weedsport, N.Y." It looks like a very nice clock, and I have been unable to obtain any parts or information on it. I have tried quite a few jobbers without success.

I need a suspension spring (I have no sample) and I may need other parts, but since I am not familiar with the clock at all, I don't know what else, if anything, I may need. Could you give me any information on this clock, and where I can buy material for it? Your cooperation will be greatly appreciated.

EDMOND H. PEPIN
15 Washington Street
West Warwick, Rhode Island

Dear Mr. Pepin:

Sorry that we have no sketch or photo of the Barr battery clock which you might use to check for missing parts. Chances are, it's all there. The suspension spring mount could be missing, as it comes off with two small nuts; however, you can readily see whether or not there is a place for this spring.

The Barr Manufacturing Company, makers of your piece, have been out of business for some time. Mr. Raymond F. Clancy, 25 East Brutus Street, Weedsport, New York, bought their parts and is now servicing these clocks. I am sure he can supply you with a new suspension spring.

The Barr clock is of the "remontoire" class. The pendulum is propelled or driven by the pressure of a little wheel rolled off a pin on the crutch, said wheel being pulled down by a small coil spring. Once it has rolled off this pin, giving the pendulum a swing or kick toward the III o'clock side, it continues downward until it closes the battery circuit. This energizes the magnet which in turn lifts or "remounts" the arm member carrying the little wheel. It remains latched in this remounted position until the amplitude of the pendulum's swing falls off a bit, the shorter stroke tripping the latch, repeating the cycle of operation again. The recording portion (hands) are driven by the pendulum by a ratchet method.

J.E.C.

Dear Mr. Coleman:

Will you send me a synopsis on the Otay watch? I have picked one up and would like to know when the company was in existence, and about what year No. 1074 was made. How many were made altogether? What company made the Plymouth, and when?

CARL NISSON
913½ Eye Street
Modesto, California

Dear Mr. Nisson:

The generally accepted dates of operation of the Otay Watch Company are from April 15, 1889 to October 13, 1890. The former date was taken from a letter of Mr. Philip Henry Wheeler written to his family and dated March 25, 1889, in which he said everything was moving forward okay, and the factory would be completed by April 15. Mr. Wheeler had been signed on February 25, 1889 as general superintendent.

The late Major Paul Chamberlain (who showed this writer the first Otay I ever saw) probably devoted more time and study to the Otay story than any other man; besides contacting every known source, he actually visited the site of the factory, which is just five miles south of National City, California in San Diego County.

Of the serial numbering, he says, "If the Otay serial numbers between the lowest

and highest were all made, the production would have been something over 29,000, a most creditable performance—personally I have seen or known of about twenty examples numbered between 1,208 and 1,340 and between 30,110 and 30,637."

If those numbers were followed consistently, there would have been 132 movements in the first group and 527 in the latter, a grand total of 659 watches. However, to date I know of no writer willing to stick his neck out far enough to pin the entire production down to the 659 figure.

A newspaper advertisement of August, 1888, stated that the capacity of the factory was to be 250 movements per day. Taking April 15, 1889 as the starting day, April 15, 1890 would be 365 days, and another 103 days would bring you to the closing date, October 13, 1890, or a total of 468 days. Allowing for some 67 Sundays, Otay must have operated about 400 days. Certainly they never reached that goal of 250-per-day.

The Chamberlain Memorial Collection contained movement No. 30,500, a P.H. Wheeler model, full-plate, 18-size, 15 jewels, with the Wheeler patented whiplash regulator. Dr. Karl Vogel, collector of New York City, has in his collection a similar movement, serial No. 1,419 (note that this is beyond the range mentioned by Major Chamberlain) and marked, "F.A. Kimball."

The Otay machinery was sold to a new firm organized to build watches, loaded upon a vessel in San Diego harbor and shipped to Alviso, California. The new firm was the San Jose Watch Company. Chamberlain says, "There is nothing to indicate that any watches were made at Alviso. Some of the Otay parts may have been assembled there, but none of the movements bear the name of the new company."

The San Jose Watch Company was incorporated May 8, 1891, and was as short-lived as the Otay. A Japanese syndicate bought the machinery, shipping it to Osaka, Japan. Movements made there were marked "Osaka Watch Co., Osaka, Japan."

Horology magazine, July, 1934 issue, carried a story from the San Diego Tribune titled, "Old Otay Factory Watch Going

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to Ford Museum." We quote a portion of that story:

"The watch is one of only six of its kind ever made, a make once designated by the late President Diaz as 'the official recognized railroad watch in Mexico.' It was acquired from Dale Smith, city clerk at National City, once an employee of the factory, by Jack Wooley, Long Beach general representative of the Ford Motor Company. In 1890 the factory produced the 'Overland Mail' movement, a 15-jeweled mechanism priced at $18 for the works only, but financial troubles overtook the factory and it was closed October 13, 1890, after only six 'Overland Mails' had been produced."

Mr. P. H. Wheeler was born at Sharon, Vermont, June 12, 1849, and died April 17, 1917 at Inglewood, California. He was described as a man of military bearing, about 6 feet tall, with brown hair, grey eyes, and weighing 200 pounds. He was possibly connected with more new watch factories than any other one man—he even went with the Otay machinery to Japan. A large volume could be written about his activities—it would be most interesting and would contain accounts of such factories as the Marion Watch Company, Springfield Watch Company, Columbus Watch Company, Rockford Watch Company, Otay, San Jose, Osaka, and others. His full life story has never been compiled. It awaits the pen and energies of some ambitious writer.

J.E.C.

Dear Mr. Coleman:

We have on the bench an Ansonia regulator wall clock, with 12-inch dial. The over-all size of the clock is approximately 16 inches by 31 inches, and the label in the case reads, "Ansonia Clock Company, New York, Factory Brooklyn."

The clock has been run very little in its lifetime because both the time and strike springs "cock over" and cut into both the side plates of the clock, as well as the great wheels. The bearings are naturally very little worn because the clock has not been used. We have tried tying back the springs with wire, etc., to no avail—they still "cut in" and the clock stops. Can you suggest anything, or can you give us the name of a good trade repairman who would really do a job on this bothersome timepiece? The customer says that he has had four different jewelers work on it, to no avail.

Could you also give us the name of a good repair firm to handle Hammond electric clocks, the small shelf or mantel type? We should like to place out some which have recently come in, as we are really "snowed under" with other work.

We get many a good point from your column, and we hope that you will continue it for a long time to come. We have been for some time one of your subscribers. Thank you for your attention.

H. S. ANDERSON

Route 1
Morgan Hill, California

Dear Mr. Anderson:

If and when one finds mainsprings "cocking over", biting into the clock frame or main-wheel, it is usually caused by an over-sized arbor hook, arbor hook too long, anchor post out of line, or worn bearings.

See that your arbor hook is barely long enough for a "positive" hook, that the post to which your spring is anchored is upright (that is, square with the movement frame) and that your winding arbor is upright and fits its bearings correctly. Put in *new* mainsprings. Once aligned, most American springs working free in the frame this way give very little trouble.

Regarding the trade repairs, we believe Mr. Theron O. Sowers, 210 South First Street, San Jose, California, is less than 50 miles from you. Drop him a line, outline your requirements, and await his instructions. According to our cross-file, he is in position to serve you, as well as being the nearest address we have to you.

J. E. C.

Dear Mr. Coleman:

Could you kindly give me some information about a Waterbury 8-day clock? This clock was made to strike the sequence of bells as used aboard ship, but unfortunately had been taken to pieces, and we think some of the parts are missing.

For your information, the striking mechanism is mounted on the back plate of the clock; attached to the extended center arbor friction tight is a two-pin lifting cam, and on the same arbor in front of this, running

tree, are the pinion and four-step snail. The 7-tooth rack and gathering pallet have been refitted, but as stated above, the lever to lift the releasing mechanism appears to be missing.

Information is also required on the sequence of bells struck in relation to time shown on the dial.

I have been a regular reader and subscriber to your magazine for 15 years or more, and I enjoy reading it very much.

R. J. HALE

6 Princes Square
Wolverhampton, England

Dear Mr. Hale:

Glad to have a query from England. I truly hope that no parts have been lost from your strike mechanism on the Waterbury ship's bell. I am sending you a photo of the complete movement, strike side (back) and by this, you can easily determine whether or not something is really missing.

In case some parts are missing, I believe we can supply accurate sizes, a sketch, etc., from our files—just write us indicating which part.

The answer to your question concerning sequence to bells struck in relation to time shown on the dial would be:

12:30—1 bell	4:30—1 bell	8:30—1 bell
1:00—2 bells	5:00—2 bells	9:00—2 bells
1:30—3 bells	5:30—3 bells	9:30—3 bells
2:00—4 bells	6:00—4 bells	10:00—4 bells
2:30—5 bells	6:30—5 bells	10:30—5 bells
3:00—6 bells	7:00—6 bells	11:00—6 bells
3:30—7 bells	7:30—7 bells	11:30—7 bells
4:00—8 bells	8:00—8 bells	12:00—8 bells

We suspect that possibly the 7-tooth rack maye be confusing, especially when one thinks of it in connection with 4-step snail. Actually the hammer makes one stroke for each tooth and the eighth for the locking notch at the bottom. It also makes two strokes for each step of the snail. There is a tail-piece extending downwards from the striking hammer pivot—a cam on the center engages a lever at the half-hour (odd strokes) allowing a pawl to catch the tail-piece on the last stroke and preventing the hammer from reaching the gong with its last stroke. Thus, for seven bells, the rack drops into the lowest notch of the snail and the mechanism actually operates for eight strokes,

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but with the last one being locked off from touching the gong, only seven bells are sounded.

J.E.C.

Dear Mr. Coleman:

Some friends of mine here in town have a wall regulator clock. They would like to know its origin and approximate age. Neither the movement nor case has any maker's name on it. The 5-foot case, which is well made of what appears to be very fine solid walnut, is enameled a flat black with yellow gold gilding in the ornamental carvings below the flat surface of the wood.

The dial is hard enamel, approximately 12 inches in diameter, and has a heavy brass bezel. The hands are moon style, are handmade and hand-blued by flame. The movement is contained in a rectangular black metal box, 5¾ inches wide, 4¾ inches deep, and 6½ inches high.

This box has no front; the back is removed by two screws and the sides are hinged. The movement is very finely made of heavy brass; pinions are cut and wheels and pinions and all other parts are on the heavy side and all very finely constructed. The plates are 1¾ inches wide by 6¼ inches high, with the pillars between them 2½ inches long. The great wheel and drum are equipped with maintaining power. The movement has a pin wheel escapement; the pins are made of brass and are half round. The movement number is 13.

The suspension is massively made and appears to be cast steel and is hand-finished. The pendulum is of the gridiron compensating type, and the bob is a large round brass conventional type.

WILLIAM J. YOST

905 Fourth Street
Milford, Nebraska

Dear Mr. Yost:

We have very little definite data on the type of clock of which you supply a very good description. Despite the fact that nearly everyone calls this pin wheel escapement the "Lepaute" escapement, it was first invented by a French horologist, Amant, previous to 1740. Jean Andre Lepaute (1720-1787), of Paris, improved it in 1753. It has been used in watches a few times, a few more in tower clocks. Towards the late 1800s many regulators like that described in your letter were made in France. Its main claim to virtue lies in the fact that when the pallet bearing holes wear, the action of the escapement is not materially affected.

Because the pendulum was hung from the movement it was quite easy to install the clock into a case. It was a popular import number, most of the cases being made in the U. S. The sweep-seconds hand, large pendulum ball and imitation (very few and only the higher priced ones had real compensation) gridiron pendulum rod made it an "impressive" regulator for the jewelry store and repair shop.

We find these clocks advertized as late as 1917. Two numbers, $81.00 and $89.00 keystone, are in the Benjamin Allen & Co. 1917 catalogue, page 814. I think World War I ended their manufacture.

J. E. C.

Dear Mr. Coleman:

I have a problem about which I hope you can give me some comfort and satisfactory information. I have the Watch Hospital here in Perry, and it is a room in my apartment. My trouble is with lint and dust flying around, settling on my bench and around my work. I keep it all covered when not working on it, but if I have to take it out again it is hard to keep from getting lint in the movements, there's just that much and that bad. I should like to mention that I heat my apartment with a Reznor gas heating unit (which has a fan) and it is in the room in which I have my shop.

I hope you can advise me what I may use or do to overcome this handicap to my repairs.

SAMUEL SARDINA

41 Leicester Street
Perry, New York

Dear Mr. Sardina:

We all have our dust problems, but I don't believe I've ever encountered it in the form you describe. Lacking definite information and experience with this, I seriously doubt that I can be of any help.

Perhaps the best try would be to consult an air conditioning engineer. First, I'd guess the moisture content of your air to be below normal. Some method of increasing the moisture in your air should go a long

way towards taking the dust and lint out of circulation. Some industrial concerns maintain electronic devices which are supposed to ionize the air and cut down on dust circulation. We know very little about this, or in what sizes these units are built; whether or not they are to be had in small units for economical use in a shop your size would have to be determined. Both G. E. and Westinghouse are building "ozone" lamps (about $1.30 each) which are odor killers and in some measure allay dust.

I regret our inability to be of help. If and when you lick this problem, won't you drop us a card and tell of the method?—the question might come up again.

J. E. C.

Dear Mr. Coleman:

I very much enjoy your column in the American Horologist and Jeweler, and look forward to getting the new issue every month. Now I have an important question to ask you.

I am an old-timer, and I have no trouble repairing watches and clocks, but I have a problem with cleaning and drying solutions. I have been making my own solution for years. I use green medical soap (about 2 teaspoons to a gallon) and about a pint of ammonia. This solution does a very good job as far as cleaning goes. For rinsing and drying, I am using benzine that comes in pint cans, sold in drug stores. I mix about ½ pint of carbon tet with about 4 pints of benzine.

About three years ago I opened a watch repair shop and I am really busy. Since I opened this place I have been coughing a lot, especially at night, and have been blaming the chemicals for that. I have been to several doctors to be looked over and have had x-rays taken, and they all claim that I am in perfect condition. I would like to know if you think that the chemicals I have mentioned might cause the coughing.

Could you tell me what you think are the best chemicals that would not be poisonous? The price is no object, as I am not trying to use cheap chemicals.

JOHN PAGAC

162 North Main Street
Barre, Vermont

Dear Mr. Pagac:

The subject matter of your letter just

GENTLEMEN NEWS ABOUT DIAMONDS

TAKE A LOUPE

Your country buys yearly from Antwerp 35-000,000 dollars of diamonds. It is a fact but that the diamonds you handle have an economical cut among them. Did you get them direct from Antwerp, or through costly intermediaries. If you are already in contact with Antwerp and have a reliable supply source, there is no need to study your eyes further. If not, contact us... save 20% to 30%, through Antwerp Wholesale prices. Diamonds Direct From Antwerp will double your margin of profit! Write today for full information. Do it now, I am sure we can do business.

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happens to be one on which we have nothing. Possibly some of our readers who have encountered similar trouble will drop in a card.

I use a cleaner with a high ammonia content, and use it hot (which increases the fumes) and have never noted that it causes coughing, but I do have a sort of ventilating system, just to keep the fumes and odors out of the shop as much as possible. It is not good to breathe or inhale chemical fumes of any type.

Why not rig up a little kitchen exhaust fan in a back window and place your cleaning operation as near it as possible, running the fan while your solutions are uncovered? You might make up a sort of sheet metal canopy or cover, on the order of those generally seen in hamburger shops, tapering it to fit an 8-inch pipe. Insert in the pipe a little 8-inch high-speed fan or rotary blower to take all fumes out. If chemical fumes are causing your cough, it follows that to eliminate them removes the cause.

J. E. C.

Dear Mr. Coleman:

Can you tell me where and when a watch was made that is marked, "Ulysse Perret, Locle"? It's silver, key-wind, No. 312451, and early 1850, we know. The watch is a family heirloom and came from the Ohio valley near Cincinnati, Ohio. Kindly advise if there is any charge. We will gladly pay to trace this watch to its source.

J. CLYDE MARQUIS

Marwick
Orange, New Jersey

Dear Mr. Marquis:

Sorry, but we do not locate the name on your Swiss watch in any of the lists available. If any reader has any data on Ulysse Perret, Locle, we would appreciate a card.

Is your case hallmarked? If it is, take a watch paper and stretch over it and make a distinct pencil-rubbing, and possibly we just might be able to come closer to the date of manufacture.

There are a number of Perrets listed, and some Perret-Gentil's—there seems to be some confusion in the use of the name. Baillie lists Jean Jacques Perret, Switzerland, 1778, who was awarded a prize for an essay on steel in watchmaking, and probably the same as Jean Jacques Perret-Gentil, Le Locle, 1750 to 1775.

He also lists Pierre Perret, Locle, first half of 18th century; Abram Louis Perret (brother of Jean Jacques) Locle, 1751 to 1761; Theodore Perret, Locle, about 1748, clockmaker to the King of Prussia. Several other Perrets are listed for Paris and various cities of Switzerland. Thus it is a family name on watches; possibly your Ulysse was either a jeweler (seller) or made so few pieces as to fail to get a listing.

The prime purpose of C. & O. is to assist the repairman in any and every way we can—there is never a charge—it is a service rendered free to subscribers of the American Horologist and Jeweler. You met the requirement when you enclosed that stamp.

J. E. C.

Dear Mr. Coleman:

I have read and enjoyed your column with its many interesting subjects. Especially was I interested in your February article on pages 57-58 in A.H. & J. on the subject of clock mainsprings.

When we clean a common 8-day clock with hour and half-hour strike, we proceed by putting a tension on the mainspring and inserting around it a ring similar in manner to the mainspring that comes to us from the manufacturer. We then release the mainspring into this ring. In most cases we also release the click spring. We then disassemble the clock, clean, and at the time, only partially clean the mainspring. Then we assemble the clock and create sufficient tension on the mainspring to remove this ring we first put on.

Next, with the aid of a second person, while one holds the movement carefully, the other one pulls out the mainspring and cleans it in the manner you described, except we finish up by using a soft, freshly oiled cloth with which to rub down the mainspring. Then we re-connect the click spring and wind up the clock. Our experience in this method has brought wonderful results.

We are continually striving to make our shop more efficient, and your column has helped in no small degree to achieve our ideals. We also, as has Mr. H. E. Bolsius, experienced great difficulty with clocks

which have barrels, especially the ones with very small diameter barrels and very wide mainsprings. I would greatly appreciate more detail in removing and replacing cleaning and oiling of clock mainsprings of the barrel variety.

Could you suggest any illustrated text books which treat the subject of mainsprings in more detail, but on the lines you use in working with mainsprings? Please do not take this letter wrong. I am not criticizing you in any respect, but I am merely anxious for more detailed knowledge on this subject. May I admit that I have a great deal of respect for a mainspring, because I have seen them mistreated, and I have also seen them mistreat hands and fingers.

EDGAR P. SCHMITT
614 West 21st Street
Cheyenne, Wyoming

Dear Mr. Schmitt:

Goodrich says, "Three quarters of the trouble with French clocks is in the spring box—mainsprings too weak, gummy or set, stop works not properly adjusted, or left off by some numbskull". This writer thinks the same applies to the common 8-day clock with free mainsprings, even though far more of them are without any stop works at all.

The principal difficulty that I see with your procedure is that you require a second man or helper. Certainly your shop must excell those who make no pretense of cleaning the spring at all.

With the type of clock you mention, we do not use the "clip" or restraining ring until after the spring has been cleaned. With an Olsen let-down key (a key with a large, round wooden hand-hold) placed over the arbor we release the click and let the spring down; the clock is taken apart and the spring removed while cleaning the plates and train. On a metal pin placed in a bracket fast to the wall for this purpose, we place the loop end of the spring, then stretch it out its full length, save for the last two coils. Into the edge of a table some four feet long and placed about seven feet from the wall bracket there has been drilled a series of holes about 4 inches apart, thus when the spring is stretched out in line along its edge, you can locate a hole very near the two coils you leave, and secure it

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with a wooden dowel pin. Clean and polish the spring from end to end with fine steel wool, finally finishing off by wiping with a rag saturated in benzine or gasoline. Dry by wiping with a fresh, clean, soft cloth. The last two uncoiled coils may be thoroughly wiped with the gasoline-soaked cloth and dried with the drying cloths by fishing them around with a piece of peg wood. Wind with the mainspring winder and place on a convenitnt size "clip". After the rest of the job is completed, replace the springs in the regular way and lubricate with Moebius spring lubricant.

You will find the mainspring and its treatment mentioned in most repair books, but we know of no work devoted entirely to this subject. Fifty cents to the Superintendent of Documents, U. S. Printing Office, Washington 25, D. C., will bring you a copy of the U.S.N. Chronometer Manual, No. 8SS-2270, which contains a couple of paragraphs, one on removing the spring from the barrel and the other on replacing it. Both are well illustrated.

Rancid oil or a poor lubricant is many times the cause of "come-backs". Clockmakers sometimes buy a large bottle of oil, then let it stand uncorked in bright sunlight or too near a heating unit in winter time. We were pleased to note that the navy and Hamilton recommend a glass hypo syringe for mainspring lubricating, because we've been using one for a dozen or fifteen years.

Your respect for mainsprings is well founded. I know just what you mean—this is being typed with one finger (usually two) because the strike spring of a 113 Seth Thomas chime clipped off about 50 per cent of the nail of the forefinger of the left hand two days ago. The mainspring is the powerhouse of the timepiece, and unless it functions properly the entire mechanism cannot.

J. E. C.

Dear Mr. Coleman:

I am a watchmaker who has been "bitten by the bug". I never knew clocks were so interesting and varied.

I bought a store in March, 1951, expecting to repair watches only; however, it appears that this store has a reputation for fine clock repairs which has been going on for over 20 years, and I've been requested to repair clocks of various shapes, sizes and vintages, about which, frankly, I know very little, but I have learned a great deal in recent months. I've had good success with several French clocks and also Gilbert and New Haven 8-day pendulum clocks. Oh yes, also two Seth Thomases. I have a long way to go, but I'm sure I'll get there.

The other day a customer brought in a German-made (I guess they're all German-made) 400-day clock on which the suspension spring was broken. I replaced the spring, but the clock will not go for more than several hours. The clock is as level as I can make it. The spring is centered, etc. This is a new clock—just received from Germany and made by Schatz.

I will certainly appreciate any information you can give me.

CHARLES J. BERKOWITZ
1150 Castle Hill Avenue
Bronx 61, New York.

Dear Mr. Berkowitz:

Why pass up a paying repair business of 20 years' establishment? Take the clocks, exercise due care and precaution when taking them in—don't take wrecks, don't underestimate jobs.

All the present versions of the 400-day torsion pendulum clocks are German-made. The company has mushroomed up at a very rapid rate since the war, and we occasionally see new ones not properly adjusted. Just what may be the cause of stoppage with this particular piece would only be a guess. Chances are, you will have to check it over completely. Remove the dial and hands and see if it will run. The arbor next to the escape wheel carries the hands, and the slightest bind will stop the clock. This is as good a place as any to begin. I suggest that you obtain from the American Horologist and Jeweler book department, a booklet, "Year Clocks, Their Characteristics and Methods of Repair" (costing $1.00) which is a reprint of an article in the January, February, and March 1950 issues, carrying a complete treatise on this type of clock. Also, the July, 1950 issue, has an article titled, "Regulating the 400-day Clock". For general clock repairing of all types, "The Modern Clock" by

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Ward L. Goodrich, (available from A.H. & J. Book department for $4.95) is very good.

J. E. C.

Dear Mr. Coleman:

I have been following your department in A.H. & J. for several years and find it very helpful. I am a retired banker and fix clocks and watches, especially clocks, for a hobby.

For some time I have been going to write and ask about taking clock springs out of barrels and putting them back again, and in the February issue you printed a letter along the lines I was interested in, and agreed that there had been little printed on this subject. It is undoubtedly my fault, but after reading your answer I was as much in the dark as ever.

I have a heavy brass winder with a crank that ratchets both ways. If I wind the spring on the winder, holding the barrel in my left hand, how can I unhook the outer end of the spring from the barrel?

In winding it back, should the outer end be hooked in the barrel held in the hand, and then wound in with the winder? Or if I wind the spring on the winder and slip the barrel over same, how can I be sure the outer end will hook on the barrel?

You also advocate straightening out springs for cleaning. How many coils should be left at the center to avoid stretching the spring too much?

Can you tell me where I can get a depthing tool for clocks, or can I make one, as I have a metal working lathe?

H. R. CHADSEY

1 Reynolds Street
Wickford, Rhode Island

Dear Mr. Chadsey:

Your first question has to do with removing the spring from its barrel, or more specifically, how to release it from the barrel hook after compressing (winding) it out of the barrel.

1. Release or turn loose of the winder crank with your right hand and slip a "clip" or "restraining ring" over the spring.

2. Continue to hold the barrel in your left hand, and with the thumb of the right hand, trip your click on the winder, gradually allowing the spring to expand by turning the crank back.

Either or both of these methods relieves all tension and frees your right hand to assist in unhooking from the barrel. And either may be reversed to replace the spring in the barrel.

Yes, I do advocate straightening the spring for cleaning. The last two coils next to the winding arbor need not be straightened. Rub briskly the entire length of the stretched portion with fine steel wool, then sponge the spring off with a clean rag saturated in some cleaner like gasoline or benzine. Lastly, give it a good wiping with a clean, dry cloth, working this cloth through those last two coils with a piece of peg wood. Replace in the barrel with a winder and lubricate with Moebius mainspring lubricant.

If you are an experienced mechanic and have the time, by all means make your clock depthing tool. You should not have much difficulty in obtaining the loan of a watch depthing tool from a watchmaker in your city to use as a model. The one for clocks is merely several times larger. The manufacture of these ceased years ago, and

the market has completely dried up. We understand that Golay Buchel & Co., Lausanne, Switzerland, have recently made a few and that you may obtain one through your regular jobber. He will have to order it from his New York City importer who, in turn, will get it from Switzerland. Mr. Charles A. Kuhn, Garfield Avenue and Albany Street, Rochester, New York, makes them upon special order.

Mr. C. G. Smith, Time Instrument Co., 307 Madison Street, Washington 11, D. C., will be ready to release a new mainspring winder soon. You might drop him a line.

J. E. C.

Dear Mr. Coleman:

Could you suggest where I might obtain a verge and verge lever, pendulum rod and suspension spring, and pendulum and bob (the regulating nut) for a 30-hour, brass, weight movement in a 26½-inch high OG case bearing the label, "Alden A. Atkins, Bristol, Connecticut"?

I acquired this for $1.25 at an auction, with these parts missing. Local watch and clock repair shops could not supply the verge and lever and thought I'd have to make one. But metal working is one hobby I've not yet become embroiled in, and I don't relish the thought.

In describing the clock at a local shop where I had gone for parts, the man referred to it as a "Sam Slick". I asked why he called it that, but he couldn't say.

So that set me to researching, whereupon I found that Sam Slick was the hero of various humorous narratives written by Judge Thomas Chandler Haliburton (1796-1865) of Nova Scotia. Sam is a Yankee clockmaker and clock peddler, full of quaint drollery, unsophisticated wit, knowledge of human nature, and adept in "soft sawder" that is, flattery. The writings, published 1837-1840, were entitled, "The Clockmaker, or Sayings and Doings of Samuel Slick of Slickville".

Perusing this material at the public library, I found but the slightest mention of actual clocks. Though they called him "clockmaker", Sam was actually only a peddler of them, and most of his rantings and adventures are in fields removed.

So I wonder just how the term got to be used, and how widespread it is. Whether it was used just because these humorous stories became popular, or whether it referred specifically to those OG, box-like cases which would certainly be more "packable" either on saddle or in wagons than pillar-and-scrolls and fancy feet!

Can you enlighten me further, Mr. Coleman?

DON ATHEARN

2116 Keith Building
Cleveland 15, Ohio

Dear Mr. Athearn:

Any Atkins clock for a buck and a quarter is a bargain. Alden A. Atkins was the Atkins of the firm, Allen & Atkins, in operation from 1837 until their failure in 1846 when they were succeeded by Smith & Goodrich. I believe this is my first meeting with a clock label marked, "Alden A. Atkins". Would you oblige with a pencilled copy?

Verges and material for these clocks haven't been available for many years. You are going to have to get the movement into the hands of a competent clockmaker who can make the required parts. There must be shops in your city specializing in this work, but we do not have a single Cleveland address in our cross-index file of clock shops. Mr. D. H. Munson, 406 Edgewood Avenue, Dayton 7, Ohio, makes a specialty of this type work.

Dr. Barclay Stephens of Alameda, California, gifted this writer with a copy of "Sam Slick the Clockmaker" several years ago. The great Artemus Ward referred to Judge Haliburton as "the founder of the American school of humor". I remember that it was good reading; but being fiction, I haven't retained much of it in memory. I believe Sam was much more of a peddler, though indulging in mechanical work occasionally by virtue of his knowledge of "saft sawder and human nater".

It would be my thought that what your repairman meant by calling your clock a "Sam Slick" was that it was a very cheap one. Competition was pretty stiff and the price meant much. Many peddlers never expected to come that way again and weren't above selling the cheapest possible article. It has been a long time, but I seem to recall that one of Sam's ventures was selling "wooden nutmegs".

J. E. C.

The Invisible Watchmaker

• • •

A hunter roamed a heathen land
When he discovered with dismay
The tracks he'd followed in the sand
Had led him many miles astray.
The midday sun was hanging high
As, watch in hand, with careful eye
He took his bearings from the sky.

Suddenly the quiet around
Was broken by a lion's call.
The hunter started at the sound
And let his precious timepiece fall.
He combed the undergrowth with care;
But had to give up in despair
And leave the watch still ticking there.

The evening shades were falling, when
A savage came upon the prize.
Fearfully he seized it, then
Examined it with wondering eyes.
The tiny wheels and springs and such,
Intrigued the savage very much;
He fingered all with careful touch.

At first he thought that he had found
Some novel insect, plant or bird;
But then the rhythmic ticking sound
Could unmistakably be heard.
And now his slow inquiring mind
Sought for the merits of his find
And soon discovered it would wind.

Then he perceived the hands revolved
According to a certain plan.
That such a thing could be evolved
And fashioned by a mortal man,
You never could convince him, for
He'd never seen the maker, nor
Did one exist in tribal lore.

How like this savage are the blind
Who see the greatest watch of all:
Our mighty universe designed
For sun to shine and rains to fall;
For days to start; for nights to close;
With seasons to rotate for those
Who live upon each thing that grows.

Machine so perfect that we are
Enabled to predict, years hence,
Movements of sun and moon and star
Arranged by Great Intelligence.
With earth and air and mighty deep;
With hearts to love and eyes to weep;
With life for work and death for sleep.

The Maker of these wonders veils
His Being from our earthly gaze;
But still His awful might prevails;
His kindly mercy lights our ways.
And just because we may not dare
Upon that Countenance to stare
How can we doubt that He is there?

—WALLACE R. PARNELL.
Hollywood, California

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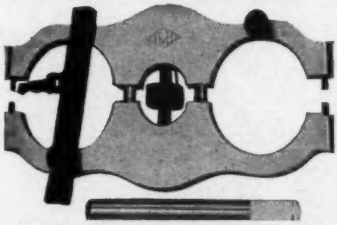

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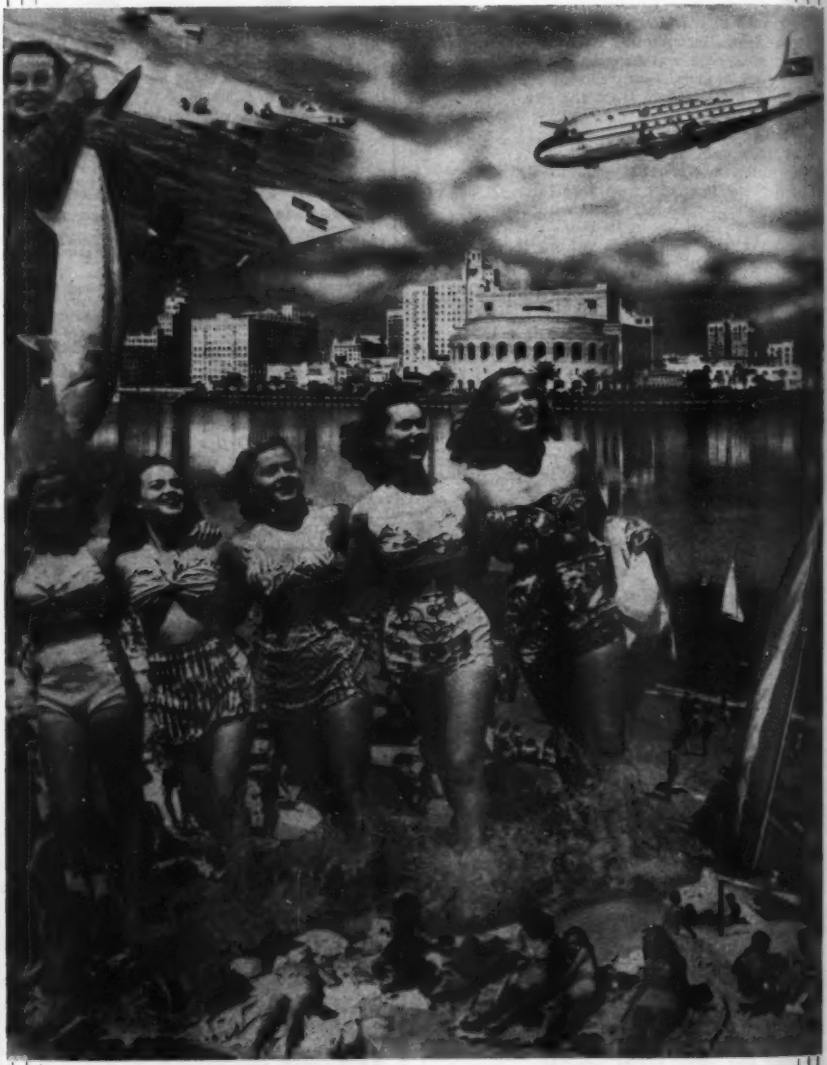


Long Beach offers a wide variety of attractions.

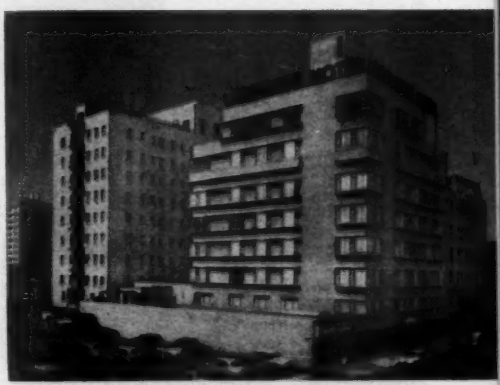
View of the famous Long Beach, California, man-made harbor which U.H.A.A. Convention visitors will tour next July as guests of the City of Long Beach.

Long Beach . . . Site of U.H.A.A. 19th Annual Convention

Delegates and visitors to the 19th National Convention of the United Horological Association of America, to be held at Long Beach, California, this coming July 12-13-14, will have an exceptionally good opportunity to combine pleasure with business. Long Beach is a top vacation resort and offers its visitors a wide variety of attractions.

Shown in the photographs here are some of the enjoyments awaiting the visitors to Long Beach. All this, of course, is in addition to the valuable educational and organizational benefits to be gained from attending the Convention. U.H.A.A. members and their families planning on attending the Convention are urged to make their reservations as soon as possible in order to secure the best accommodations. All reservations can be taken care of through U.H.A.A. National Headquarters, 1901 E. Colfax Ave., Denver 6, Colorado.

Lafayette Hotel — U.H.A.A. Convention Headquarters—offers beautiful modern rooms and suites, drive-in auto-lobby, outstanding food and service.



This is the boat which will take visitors on a tour of the magnificent Long Beach Harbor. The "Shearwater" is equipped with loudspeaking equipment for a verbal description of the entire harbor.

• • •

Fabulous Knott's Berry Farm, world-renowned for its excellent food, will be a prime point of interest for Convention visitors. Shown here are the narrow-gauge railroad and Calico Saloon, newest attractions in the Ghost Town on Knott's Berry Farm.

Guild and Association News

PLAN SYMPOSIUM FOR CALIFORNIA WATCHMAKERS

A symposium for watchmakers and jewelers of Northern California has been arranged by Felix Buonaventura under the sponsorship of the Watchmakers Guild of Santa Clara County, to be held at 7:45 p. m., May 6, in the Little Theater of San Jose college.

Theron O. Sowers, regional vice president of the Horological Institute of America, will speak on the repair of chronographs, and his talk will be supplemented by motion pictures and slides.

"The Necessity and Economy of Using Genuine Material" will be the subject of a talk given by Bert Nordman, and Mr. Buonaventura will demonstrate cleaning and recording machines. A. L. Pooler will preside at the symposium, and will speak on "Today's Problems Confronting the Watchmaker."

Persons desiring bus-ride from Oakland and San Francisco to the Little Theater on the campus in San Jose are asked to telephone Felix Buonaventura, Yukon 6-1658 in San Francisco for reservations.

NEBRASKA ASSOCIATION HOLDS SUCCESSFUL CONVENTION

The 47th annual convention of the Nebraska Retail Jewelers and Horological Association was deemed a great success by the 300 members who met in Grand Island for the three-day session, March 15-17. Convention headquarters were at the Yancey hotel.

Earl Oliver of Hastings, who has been serving the organization as secretary-treasurer, was elected as the new president, and tribute was paid Vincent J. Stead, outgoing president, for his fine work of the past two years.

Other new officers chosen were Russell Mason, Lincoln, first vice president; L. L. Lockwood, Sidney, second vice president; and William J. Yost, Milford, secretary-treasurer.

Convention speakers included William H. Rice, representing the Watchmakers of

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Attractive Plastic Display Box 66c extra

Terms 2/10 to rated firms. Others send check, M.O., or C.O.D.

KERSWILL

Switzerland; R. W. Slaugh of the Hamilton Watch company; Granville Webb of the Elgin National Watch company; Orville R. Hagans, executive secretary of U.H.A.A. and editor and publisher of the American Horologist and Jeweler; and L. M. Lewis and Max Lee of Southwestern State college.

Hugh Butler, Nebraska senator, arrived by plane to pay an unannounced visit to the convention. He commended the group for their activities which he said were of great help to the state and to the country, and pledged his support.

W. Van Murchie, business man and banker, and widely known as a lecturer, was the speaker Sunday night at the convention banquet, a highlight of the social meetings which rounded out the convention program.

QUESTION FORUM FEATURED AT ILLINOIS MEETING

A "question forum" was the feature of a meeting held recently by the Illinois Watchmakers Association in the LaSalle Hotel in Chicago. Cards with post-free return envelopes were mailed to members, and they were invited to write questions to be submitted to the panel of experts.

The panel was selected to include men qualified to answer the technical questions from their own experience and from contact with leaders in the horological field.

H. I. A. ANNOUNCES PROGRAM FOR ANNUAL CONVENTION

The Horological Institute of America has set May 10-12 as the date for its annual convention to be held in Washington, D. C.

A well-rounded business and social program has been planned, and convention speakers will include M. N. Rivenburg, manager of sales analysis, Hamilton Watch Company; Eugene Sobel, vice president of Watch Materials Dealers association; Dr. A. L. Rawlings, chief of gyroscopic section, Bulova Research and Development laboratories; D. W. Leverenz, superintendent of inspection, Elgin National Watch company; Paul Tschudin, director, Watchmakers of Switzerland Information Center; and Leo F. Henebry, president of the American National Retail Jewelers association.

Frank D. Urie, director of economic research, Elgin Watch company, will act as moderator for a question-and-answer panel. Invited to participate as speakers on the panel are P. Buford Harris of the Southern Jeweler, Henry B. Fried of the National Jeweler and H. I. A. Journal, James J. O'Shaughnessy of Jewelry magazine, and W. H. Samelius and J. E. Coleman of the American Horologist and Jeweler.

GUILD MEETING DATES

CALIFORNIA

Long Beach Guild:
Fourth Wednesday of each month

Los Angeles Guild:
Third Wednesday of each month, 8 p.m. No meetings in August or December. Election in November

IOWA

Fort Dodge District Watchmakers Guild:
Second Tuesday of each Month. No meetings June, July, August or December.

Northwest Iowa Watchmaker's Guild:
Second Tuesday of each month. Meeting place rotates Storm Lake to Cherokee to Spencer.

Waterloo Watchmakers Guild:
Second Thursday of each month. No meetings, July, August or December.

LOUISIANA

Alexandria Watchmakers Guild:
First Wednesday of each month.

Baton Rouge Watchmakers Guild:
Second Tuesday of each month.

New Orleans Watchmakers Guild:
First Monday of each month.

Shreveport-Bossier Watchmakers Association:
First Thursday of each month.

Southwest Watchmakers Guild: St. Charles
First Wednesday of each month

MARYLAND

Horological Guild of Baltimore: Last Wednesday of each month.

MICHIGAN

Greater Detroit Horological Society: Second Monday each month, 8 p.m.

MINNESOTA

Minneapolis Watchmakers Guild: Second Wednesday of each month. No meetings July, August and December.

NEW HAMPSHIRE-VERMONT

Twin States Watchmaker's Guild: Lebanon, N. H., Second Monday each month, 7:30 p.m.

NORTH CAROLINA

Winston-Salem Watchmakers Guild: Second Thursday each month, 7:30 p.m.

OKLAHOMA

Oklahoma City Watchmakers Guild: Third Friday each month, 6:30 p.m. No meeting July and August.

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Collectors Plan June Convention

NAWCC Members Choose Historic Sturbridge as Site of 1952 Session

MEMBERS of the National Association of Watch and Clock Collectors have chosen Sturbridge, Mass., as the site of their eighth annual meeting, to be in session June 6-8, and Old Sturbridge Village will be the center of activities.

The village is a relocated and reconstructed typical country town of New England, as it might have existed in the early 1800s. One of the founders of the village is NAWCC member, J. Cheney Wells, and many of his fine clocks are displayed there. Horologists will be especially interested in the Clock Museum and the old Spectacle Shop. In the former is displayed a large part of the Wells collection of clocks, and there also will be found a special exhibit of watches which is being arranged for the period of the meeting by Jean Roerich. The basement of the Spectacle Shop has been set aside by Village authorities for a temporary exhibit being arranged by the convention committee.

Since this is the first NAWCC meeting to be held in New England, the exhibit committee has concentrated their efforts on displaying clocks which are typically of New England origin. Reginald Morrell of Bristol, Conn., is gathering material for the largest and most comprehensive showing of wooden movements ever displayed at one time. He is endeavoring to show all known types of wooden movements that can be located and obtained for exhibit.

Few New England clocks have become so sought after by collectors as the various types of wagon-springs, and Fred M. Selchow of Jericho, L. I., N. Y., authority on wagon-springs, is arranging a display of a number of types of these. Another clock distinctly of New England origin is the New Hampshire mirror clock, made by a number of different makers, with a wide variation in movements and some variation in cases. A number of unusual examples of these will be on display.

As usual, members are being invited to bring any unusual horological specimens for display, sale, or exchange. A display and trading table will be set up at the Friday evening session and during Saturday afternoon.

Baptist Meeting House on Sturbridge Village common, where a Howard Davis tower clock was installed by NAWCC member Douglas K. Merrill, in 1948. In the right foreground is seen the Mashapaug House, a late 17th century one room dwelling, with ells added in characteristic 18th century fashion.

A full program of meetings is being arranged, and as in the past, the first formal session will be a meeting of the Council at 11 a. m. on Friday. Lunch at the Village Tavern at 1 p. m. will be followed by the annual meeting of the Association. Reports of officers and all standing committees, and transaction of other business will be heard. A social hours with cocktails is planned for late Friday afternoon at the Village Tavern. On Friday night, members may choose between a New England style church supper at the Sturbridge Federated church, or dinner at the Publick House—both are on the green in Sturbridge proper.

The evening meeting will be divided into two sections, with one section devoting its time exclusively to the intricacies and special fine points of watches, and at the same time, but in a different room, there will be a symposium on wooden movements for the collectors of these machines. A fine panel of speakers has been obtained for these sessions.

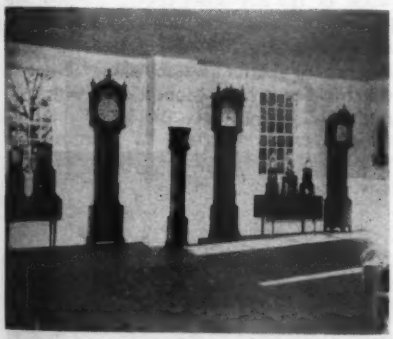
On Saturday there will be a large range of events to choose from: Tours to special collections, inspection of the various permanent exhibits and special displays in the

Village and a program of morning and afternoon sessions at which papers and reports will be given. Speakers will include Paul Hollingshead, Jean Roehrich, Ted Lang, G. E. Andrews, Sam Barington, E. H. Goldsmith, George Hull of Bristol, Philip Jenkins, Ed Burt, Lewis Dyer, Reginald Morrell, Sam Jennings and others.

The high point of the meetings will be the annual dinner to be held Saturday evening at the Hamilton Rod and Gun Club, two miles from Sturbridge. During dinner, there will be music by a specialist using various types of old-time instruments he has restored. The dinner will be in the nature of a New England clam bake. Orville R. Hagans, editor and publisher of *The American Horologist and Jeweler* will be the after-dinner speaker.

No formal sessions are planned for Sunday, so that members can spend more time in Old Sturbridge Village and visit nearby collections.

Members of the convention committee include Douglas K. Merrill, chairman, Sturbridge, Mass.; Amos G. Avery, co-chairman, Amherst, Mass.; Leonard J. Panaggio, publicity, Newport, R. I.; Arthur Bloom, exhibits, Wellesley, Mass.; Rowe S. Clark, Brimfield, Mass.; Reginald G. Morrell, Bristol, Conn.; Russell W. Nadeau, Webster, Mass.; Jean Roehrich, New York; Willard Porter, Sturbridge, Mass.; Roscoe Whitney, Leominster, Mass.; Fred



An interior view of the Clock Shop in Old Sturbridge Village.

M. Selchow, Jerico, Long Island, N. Y.; Donald K. Packard, Boston, president of the New England chapter of NAWCC, and chairman, ex-officio.

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Tweezer Sharpener Deluxe

Take a pair of tweezers and bring the points together. Is there no daylight showing? Do they come together right down to the very tip with no turnup at the end? Are the inside faces so finished as to securely hold the smallest jewel screw or hairspring pin? That is the way tweezers are refinished by Valdemar Virtanen.

The problem of keeping his tweezers in good working order is one that has plagued the watchmaker ever since he began his trade.

As every watchmaker knows, tweezers are the most used tool in his business, and as a result of ordinary wear, or from accident, tweezers will get in a condition that makes for a very unhappy watchmaker.

Reconditioning tweezers by watchmakers has met with varying success, mostly not good. For some reason, they seldom can be restored to their original condition.

With some of today's stainless steel tweezers, and others of unknown quality, to make life more complicated, a new pair of tweezers is sometimes the best solution.

Several years ago, in 1941 to be exact, the problem was the same. But due to world conditions and the war, new tweezers were hard to get. The good ones were imported, and the cost had gone sky high.

It was at this point in our story that one watchmaker, Valdemar Virtanen, came into the picture quite by accident. Old world trained, in his native Finland, by his father, a real craftsman whose belief was that "One pair of tweezers should last a lifetime," Virtanen spent several years working for leading jewelers in the United States. Finally in 1941 he found himself settled near Morristown, N. J.

On the eve of a vacation, a fellow watchmaker left a pair of tweezers with Virtanen, to see what he could do with them. Anxious to be off on his vacation, Virtanen did what he could for him. Two weeks later when he came back Virtanen found a dozen pair of tweezers waiting to be put in order.

This was in 1941, the days of hard-to-get tweezers, and then only at a high price. This presented quite a problem, and also a question: Could refinishing tweezers at $1.00 a pair be made into a worthwhile business?

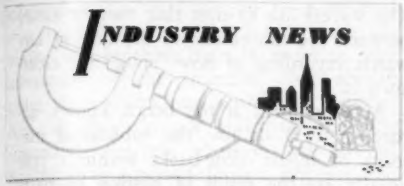
So, after months of different techniques and designing special equipment, he started making good tweezers out of bad ones. Finally he reached the stage of putting several advertisements in the trade magazines. Before he knew it he was getting anywhere from a single pair of tweezers to two or three dozen pairs per customer; and from practically every state in the Union as well as from Canada, the West Indies, South America and Alaska.

This meant new and improved methods, and more efficient machines which he had to design and build himself. It also required a better knowledge of the many kinds of steels used by different makers.

Valdemar Virtanen, now after 10 years of developing his technique and skill, believes that he can do a better job of refinishing a pair of tweezers than the manufacturer who makes them. Seldom a week goes by that he doesn't get brand new tweezers, never yet used, to be refinished. The continued repeat business is proof of satisfied customers from all parts of the country, who know a pair of well-finished tweezers when they see them.

Virtanen has now reached the point in his work where he feels he can advertise *"Guaranteed Satisfaction."* He asks his customers how they want their tweezers finished: hairspring, fine or regular benchwork, or for any other special purpose. He says, "Properly finished tweezers make easier and better work; and better work makes for better watchmakers. Being a watchmaker is hard enough even with good tools, so why not have the best?"

Virtanen is shown here at an emery belt machine reconditioning and getting tweezers ready for final finishing by hand. Previous steps include removing surplus stock and aligning and shaping points on emery wheel machines.



LUCKEY NAMED HAMILTON WATCH PRESIDENT

George P. Luckey, former vice president in charge of manufacturing, was elected president and chairman of the board of the Hamilton Watch Company at the regular monthly meeting of the firm's Board of Directors, Thursday, February 28th. The Board also named Arthur B. Sinkler vice president and a director of the company to succeed Mr. Luckey. Mr. Sinkler was assistant secretary and director of research. Richard J. Blakinger, general counsel, was elected to succeed Mr. Sinkler as assistant secretary.

The Board also passed a resolution paying tribute to Mr. Charles C. Smith, the late company president. "Mr. Smith served the company faithfully and well for a period of more than 20 years," the Board said. "When called upon to assume full responsibility as president, he accepted with no hesitation. His prudent counsel and unobtrusive leadership has strengthened our organization."

Other company officers remain unchanged. They are, Lowell F. Halligan, vice president in charge of sales; Robert B. Thompson, vice president in charge of finance; Harry R. Lawrence, treasurer; and Roland Raver, secretary and comptroller.

Mr. Luckey has been with Hamilton since 1927. He has been active in the technical end of the business, being credited with the invention of the time microscope, the first electrical timing device of its kind.

The time microscope rendered obsolete, older, costlier, and less efficient factory methods for timing newly assembled watches.

Mr. Luckey also supervised Hamilton's conversion and activities in making items

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for the armed forces during World War II. He is credited with directing Hamilton's present advanced methods of watch assembly. The new Hamilton laboratory also was part of his planning.

Mr. Luckey's first post with Hamilton was head of the tachometer department. He was appointed director of research and assistant superintendent in 1930. In 1933 he was made factory manager. He has been vice president in charge of manufacturing since 1940.

A native of Ontario, Calif., Mr. Luckey graduated from the University of Nebraska and took post-graduate work at the University of Goettingen, Germany. Later he was a member of the staffs at Mt. Wilson Observatory (Calif.) and Carnegie Institute. From 1916 to 1919, he was engaged in scientific research at General Electric's Nela Research Laboratory in Cleveland and at Westinghouse Laboratory in Pittsburgh.

He then joined the staff of the Naval Experimental Station at New London, Conn., where in 1918 he was a cadet and Air Corps officer. From 1920 to 1926, he was a physicist at the engineering division of the Air Corps, chief of the instrument and navigation branch, and assistant chief of the equipment section at McCook Field in Ohio.

B. JADOW, INC., INTRODUCES NEW PRODUCT TO THE TRADE

According to B. Jadow, Inc., New York, they have introduced to the watch repair trade a new product that has conquered the age old rust problem.

B. Jadow states that this discovery, one of the most important advances in modern horological history, was developed in the laboratories of Troop-Balas & Co. after almost twelve years of continuous experimentation. Extremely simple and absolutely foolproof in application, it is said to be the first truly effective solution to a situation which man has been battling unsuccessfully since ferrous metals first were used.

Called "Neve Rust," this product is a chemically impregnated tissue-thin wafer, in sizes to fit every size and shape of watch, from the smallest to the largest. The wafers are so thin that they fit easily between the movement of the case of any watch, regardless of how "snug" the clearance is.

As every man at the bench knows, according to B. Jadow, the substantial majority of repair come-backs within a year usually are the result of rusting of parts over which he has no control. A serious problem in average climates, it is an especially costly and bothersome situation during damp seasons, or in areas where humidity is chronically high all year long.

With "Neve Rust" the watchmaker can end the problem for all time—and build his business at the same time. The tiny wafer is not only a boon to the repair man in his fight against rust and corrosion, but it also is a scientifically effective stimulator for new business, according to B. Jadow.

"Neve Rust" is offered to the trade in a complete kit, containing a supply sufficient for fully protecting 100 watches for one full year each—for all sizes from 3¼ to 22 ligne, and for every shape of watch made. Included in the kit is a colorful and effective window display card, and 100 printed tags for attachment to treated watches. These also notify the customer when the watch is due back for a new protective treatment.

The entire "Neve Rust" kit is priced at $5.50. According to the manufacturer, the kit will save the watchmaker several times the cost just in the come-backs it eliminates, besides the satisfied customers it retains and the very profitable new business it creates. The "Neve Rust" kits, and refills, are available through all material wholesalers.

L&R ANNOUNCE AVAILABILITY OF NEW CLEANING MACHINE

The L&R Manufacturing Co., of Arlington, New Jersey, announces that for the first time since the introduction of the L&R Automatic Watch Cleaning Machine a limited number are available now for immediate delivery. The Automatic has consistently been oversold, even though the company has steadily increased its production facilities for what they term the most wanted of all machines. For the first time in many months, the trade is being ad-

vised that the machine can be purchased and shipped at once. L&R is, therefore, advising watchmakers that, in order to take advantage of the situation, they should place their orders now with their distributors, as they do not anticipate that the immediate delivery situation will prevail for too long a period. Only a few hundred of these machines can be made each year because each unit is individually constructed and tested exhaustively before it is sent along to the purchaser.

The list price for the L&R Automatic is $274.50; it is sold only through watch material distributors from coast to coast. Further information regarding the machine may be obtained by writing direct to the manufacturer: L&R Manufacturing Co., 577 Elm Street, Arlington, New Jersey.

HADLEY CO. OFFICES MOVED TO ELGIN, ILL.

The Hadley Company Inc., Providence, R. I., new subsidiary of Elgin National Watch Company and manufacturers of watch attachments and men's jewelry, has moved its general offices to Elgin and will use its Providence plant solely for production and service.

At the same time Hadley announced it is embarking on a comprehensive styling program for all its products and that some of the new attachments and jewelry items will be ready for marketing by June.

Fred Birch, Hadley vice president in charge of production and a veteran member of the organization, will be in charge of the Providence plant. Robert Simkins, formerly director of sales research for Elgin National Watch Company, has been named general sales manager for Hadley.

As part of a thorough modernization program for the line, Hadley will also introduce new packaging next summer, specially designed to lend itself for sales promotion purposes. Point of sale material, including both window and counter units, will also be provided for the benefit of the distributors and the retail jeweler.

JEWELERS WARNED AGAINST IMPROPER PACKAGE USE

Several retail jewelers, in and around the Metropolitan New York Area, have recently received communications from Jacoby-Bender, Inc., manufacturers of J-B Watch Bands, regarding improper use of

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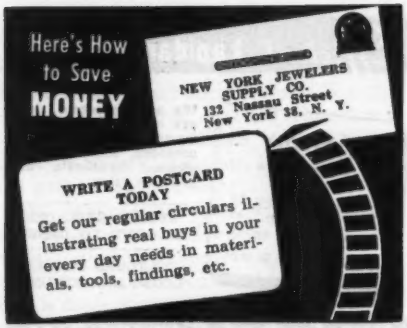
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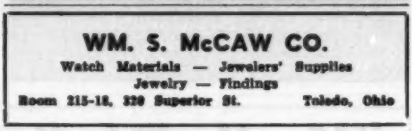

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J-B packaging material. Sales service representatives, employed by that company, found these jewelers displaying watch bands of another make on the velvet covered cards to which J-B Watch Bands were originally attached.

The jewelers in question had apparently sold the J-B bands to customers who purchased them for immediate wear, leaving the velvet display cards behind. Because of the unusual display features embodied in the cards, the jewelers apparently decided to use them again with merchandise of other manufacture without realizing that such action was in violation of the law.

It would be well for all merchants to remember that the use of one manufacturer's package or display material to show or sell another maker's product is a deception on the public and as such is a violation of state laws. The safest thing to do, when packages or display material are left over, is to discard them at once. Or, if retained, to make absolutely certain that only the original manufacturer's product is used in connection with such material. In this way the jeweler can save himself unpleasantness and possibly legal embarrassment.

NEW QUICK FIT CATALOG RELEASED

In answer to the many requests from watchmakers, Hammel Riglander announce that the new 160-page Quick Fit Material Catalog, number 1952M is now being distributed by leading jobbers of watch material.

The catalog features identification charts for Swiss watches showing actual shapes and sizes of movements. Separate sections for Automatic and Chronograph watches and complete lists showing interchangeability help make this an easy-to-use catalog for every day reference.

In addition the catalog answers problems such as how to identify and order parts for movements with the same setting parts; which staff is correct where more than one is available for a particular caliber; what is the basic caliber for a certain importer's watch; what size mainspring to use and how to order for chronographs. It simpli-

fies identification, ordering, and stocking of Swiss watch materials in a straightforward and concise way so that it covers all phases in its information packed pages.

Every watchmaker will want this catalog and he should ask his jobber how to obtain one.

MANAGEMENT HEADS OF WALTHAM WATCH CO.

Shown above are Teviah Sachs, right, president and treasurer, and Gilbert Sachs, secretary and manager of Watch Division of the Waltham Watch Co., Waltham, Massachusetts. The U. S. Supreme Court in Washington, on March 3rd, denied an application for a writ of certiorari brought by two stockholders objecting to a plan of reorganization approved by the U. S. District Court and affirmed by the U. S. Court of Appeals for the First Circuit. In a statement issued by the trustees following the decision, the court action was hailed as a final victory for the trustees' reorganization plan and as insuring present management of Waltham Watch headed by the Messrs. Sachs.

WATCH BAND TRADE-IN SALE OFFERED TO RETAIL JEWELERS

The jewelers and watchmakers of America have been offered the opportunity to conduct a Trade-In Sale on watch bands patterned after the promotion that proved tremendously successful last year. All of the material for running such a sale is being supplied absolutely free by Jacoby-Bender, Inc., manufacturers of J-B Watch Bands. Since all of the window streamers, display cards, mailing cards and newspaper mats naturally feature J-B Watch Bands the sale is necessarily limited to those jewelers who have that product in stock.

Briefly described, the Trade-In Sale

Diamonds
direct from Antwerp
double
the jeweler's
margin of profit
JOACHIM GOLDENSTERN
Diamond Club, Antwerp, Belgium

KNOW YOUR VIBRATOR
Thousands of Jewelers use our Vibrating Service because of its Economy, Speed and Dependability.
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Chain
For jewelry repairing
Write for Price List 50
HOOVER & STRONG, Inc.
Golden Rule REFINERS Since 1912
117 W. Tupper St. Buffalo 1, N. Y.

Early American Clock Dials
The duplication, repair or refinishing our specialty
Estimates cheerfully given.
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Do not accept substitutes! This sealed envelope is your guarantee that the merchandise is correct, quantity is right, and identification is easy.
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Gold Solders
All standard karats and colors
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WATCH MATERIALS
Florida's largest watch material house
Serving the Nation by mail.
Prompt mail service
Write for Price List 59
DEAN COMPANY
7½ N. Atlantic Ave., Daytona Beach, Fla.

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KBF
Specialists in
Hard-To-Get Parts
NEW AND USED
No Service Charge
All Swiss and American Watch Materials
GS and Perfit Crystals
JB Watch Bands
Hadley Men's Jewelry
Used Movements for Every Case—Needing a Cleaning Only
New Watches—A Complete Line at Rock Bottom Prices
Write Postcard Today for Free Catalogues
KBF DISTRIBUTING CO.
71 NASSAU ST. NEW YORK 38, N. Y.

MICROTIME WATCH and CLOCK OILS
BEST by TEST
Order Through Your Jobber Now!
THE NEWALL MFG. CO.
CHICAGO 2 ILLINOIS

works very much like this: Jewelers offer an allowance of one dollar on any old leather strap, cord or watch band. This dollar allowance is credited against the purchase of a new J-B Watch Band. The customer is therefore given the opportunity to buy a nationally advertised product for one dollar less than the regular advertised retail price.

When a retail jeweler has made 12 such sales and has accumulated 12 old leather straps, cords or watch bands, he sends them in to Jacoby-Bender, Inc., who will give a credit of 25c in merchandise for each such old watch attachment turned in, provided the jeweler at that time places an order for 12 new J-B Watch Bands to replace the 12 bands that were sold. The jeweler is given his choice of any J-B Watch Band that regularly wholesales at $3.00 in exchange for the 12 old attachments sent in.

The Trade-In Sale kit, which is supplied free, includes window streamers, display cards, an instruction folder, newspaper mats and the mailing cards. Any jeweler featuring J-B Watch Bands who wants to run this Trade-In Sale may direct his request to Jacoby-Bender, Inc., 161 Sixth Avenue, New York 13, N. Y.

NEW WAKMANN MODELS SHOW 'FREE-FLOW' DESIGN

Heralding important introductions for spring promotion, the Wakmann Watch Company, Inc., 452 Fifth Avenue, New York, announces major new models. Included are a 17-jewel Incabloc wafer-thin watch for men, priced at $39.50 Keystone, and a 17-jewel Incabloc snap-on bracelet timepiece for women, priced at $37.50 Keystone.

The new Wakmann models incorporate

design features described as "Free-Flow", with emphasis on unity of line and individual treatment of proportion. In the expansion bracelet men's watch shown here, "Free-Flow" effect is achieved through combination of a flat open-faced dial, with thin swept-back end pieces. Wedge shaped hour strokes and a bold two-tone dial add strategic visual interest.

Wakmann's new snap-on bracelet for women pays similar attention to detail. Major over-the-counter sales points are the dramatically faceted "Free-Flow" end pieces, raised crystal, and safety chain on the bracelet. Both watches are cased in 10 Kt. rolled gold plate with stainless steel back, and are supported by the sales-proven Wakmann One Year Repair Policy.

WALTHAM WATCH CO. TO DISTRIBUTE THRU WHOLESALERS

The Waltham Watch Company, now in production on its new 1952 Waltham watch line, has announced the return to its traditional policy of distributing Waltham watches through authorized wholesalers.

The company commitment to this sales policy is assured of an enthusiastic retail trade response, since the jewelers have expressed and demonstrated their preference of buying watches through wholesale distributors. The decision to sell through the wholesalers, according to Waltham management, was arrived at after careful research and study. Waltham Watch Company stated that it could have instituted this new policy with the wholesaler a year ago, but the management of the company felt that they should demonstrate the acceptance for Waltham watches by the retail jewelers.

In the fall of 1951 a special sectional test sales program was initiated. "The results" said Mr. Sachs, President of Waltham Watch, "were more than gratifying and made possible the completion of our plans to sell through wholesale distributors." Mr. Sachs further stated that retail jewelers bought and featured Waltham watches and paid thousands of dollars of their own money in this trial area to advertise their stores as headquarters for Waltham watches. "The response of the buying public was great," said Mr. Sachs. "Almost all of the retailers re-ordered after

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63 YEARS SERVICE
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The House that Serves the Jeweler
GENUINE FACTORY MATERIALS
FOR ALL
AMERICAN & SWISS WATCHES
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Watch Case Repairs

Bezels, Backs, Etc., Made to Order in Any Metal

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CAN'T BE TOLD FROM NEW

R.R. Watches, all kinds; Wrist watches by ELGIN, HAMILTON, BULOVA

Write for Latest Price List

Mark-Nelson Watch Co.

1212 Holland Bldg., St. Louis, Missouri

making their initial purchase. The Waltham name is very favorably known to the buying population of the United States.

"An independent research showed that a large portion of the consumers questioned rated Waltham high in its standing for 'quality and reliability'."

Mr. Sachs stated that it was particularly appropriate that Waltham the first American watch, should return to its traditional policy of cooperative effort with the wholesaler to bring better service to the retail jeweler. Mr. Sachs defined "service" as keeping the jeweler informed of promotional plans, advertising plans and the sales producing point-of-sale merchandising, as well as frequent contact service by the wholesaler's representative.

"In establishing our list of authorized wholesalers, we first contacted previous wholesalers of Waltham watches because these firms have had long experience in the marketing of Waltham watches," Mr. Sachs said. The company stated that every wholesaler had shown great interest in the Waltham plan and reports that progress to date has been more than satisfactory. Each wholesaler, as appointed, will send out a notice of appointment to his customers, and Waltham will announce its list of authorized distributors as soon as it is completed. Company representatives are now traveling throughout the United States, and the management expects to have the initial task of establishing distribution agencies completed within the next two months."

The company stated that no effort is being spared to bring to the retail jeweler every assistance to help him to greater volume and profits and to enable the jeweler to cash in on the great consumer acceptance that the Waltham name has created over the years.

"The long-range planning," said Mr. Sachs, "that has gone on here at the Waltham factory to bring about the re-establishment of a successful policy of distribution through wholesalers seems nearing its completion. There has been enthusiastic support from the retail jewelers and the wholesalers. The fact that Waltham has been able to assemble as its wholesale

distributors such important wholesalers as have already accepted appointment and have placed substantial inventory orders seems to be the final assurance of the return of Waltham watches to their proper place in the jewelry industry of America."

ZENITH MARKETS NEW INDUSTRIAL CLEANING MACHINE

Zenith Manufacturing and Chemical Corporation, New York, manufacturers of a line of widely used Watch Cleaning Machines, announces a new type of Cleaning Machine for all industrial uses.

The new machine, called "Instro-Met," has been more than three years in the making. Designed specifically for cleaning every kind of instrument with small or large delicate parts, the final model has been thoroughly tested for months under actual working conditions. "Instro-Met" is especially recommended for cleaning Aviation, Time Clock, Meter, Radio and Television, Typewriter, Bearings and Screw Machine Parts, as well as all electrical and mechanical machine parts requiring precision cleaning.

Many new and revolutionary improvements have been incorporated in "Instro-Met" to increase efficiency and assure highest safety. Foremost among these are:

1. Three clear-view windows on motor support for instant checking while machine is in operation.

2. Spun aluminum tanks and covers instead of hazardous glass. All are 10" high and have 10" diameters—4 gallon capacity.

3. Heavy cast aluminum basket with 33⅓% more capacity . . 7 3/16" inside diameter; 3¾" deep. Basket also has three monel mesh removable compartments for cleaning a variety of different parts simultaneously.

4. Simple snap-on operation of basket to impeller shaft eliminates hazards of accidental loosening. Inner steel tube of center supporting column is splined for automatic centering over tanks and dryer. Basket lowers only when in proper position. "Finger-tip" control enables female

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old and new!
HOROLOVAR TEMPERATURE COMPENSATING PENDULUM SUSPENSION SPRINGS
30 TIMES MORE ACCURATE THAN BRONZE
available in all strengths:
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Also in STANDARD DOZEN assortment
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Write for FREE sample and details
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Manufacturers of Gold-Filled Crowns
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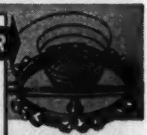
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Jewelers' Findings

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5 Waterproof Wristwatches, 7 to 17 J.....$18.00
5-6 size Elg., Wal., Hamp., in htg. and O.F. white and yellow cases.....$18.00
5 American Wristwatches, Elg., Wal., etc.....$18.00
5 6x8 FF120, etc., Ladies' W.W. 7 to 17J.....$18.00
All above need minor repairs. Write for our price list.
500 stones removed from jewelry.....$ 5.00
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WATCH CROWNS - SPRING BARS
TO DISTRIBUTORS, WHOLESALERS AND MANUFACTURERS
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Guaranteed movement 17J 6x8L, RGP/SB case. Dome crystal, cord hand. **$9.65**
Write for catalog of *861 "NAME BRAND" Watches
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FREE CATALOG of FINE QUALITY WATCH MATERIALS
Halgrin Watch Co.
Mail Order Specialists
56 Featherbed Lane N. Y. 53, N. Y.

Stamping and Blanking
Karat Gold - Silver - Platinum - Palladium
Write for Price List 50
HOOVER & STRONG, Inc.
Golden Rule REFINERS Since 1912
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INDUSTRY NEWS

Continued

operator to work the machine without fatigue.

5. Overall size: 23¼" x 26¼" — 26" high.

Other advantages of "Instro-Met" are the powerful 14-to-1 gear reduction, ball bearing motor—A/C-D/C—with reversing action; motor-driven unit for faster drying; heavy cast aluminum base assuring steady, smooth, vibrationless performance. The weight of the basket and parts is supported by ball and needle bearings, taking all "thrust" off the motor. A master switch controls the entire machine. There are reversing switch, heater switch and rheostat control for the various motor speeds. "Instro-Met" is finished in lustrous black crackle, and all metal parts are mirror polished or plated.

A feature advantage is that "Instro-Met" is the only cleaning machine built to accommodate the new-type Parking Meters without disassembling the entire train.

"Instro-Met" is priced at $279.50, complete, and is fully guaranteed. Complete illustrated specification sheet and further details may be obtained direct from Zenith Manufacturing and Chemical Corporation, 52 Beekman Street, New York 38, N. Y.

1952 NATIONWIDE SILVER PROMOTION GETS NEW NAME

The annual nationwide silver promotion sponsored by the Jewelry Industry Council since 1948, scheduled to take place during the period April 24 to May 3 of this year, will be sparked by a number of changes including a new name and new emblem.

The name of the promotion will be "Silver Fashion Parade" replacing the former title, "Silver Parade."

The emblem of the promotion has also been changed to conform to the new name of the promotion. Instead of the victory wreath used in the past, the new symbol will have as its focal point an engraver's lettering of the initials of the words Silver Fashion Parade. The initials will have the appearance of fine engraving on silver.

The idea book which the Council has furnished in other years to retailers for this nationwide promotion has been planned as a sales kit this year.

In this kit newspaper ads, radio commercials, direct mail suggestions, and suggestions for building store traffic will be offered on separate sheets which the retailers may pull out singly and use readily.

There will be four newspaper ad layouts with suggested copy; four radio commercials; two customer letters for direct mail; a series of suggestions for building store traffic during the promotion; two window display cards; and four different and definite suggestions on creating window displays.

Letters... TO THE EDITOR

PLAN FOR FILING A. H. & J. COPIES

Dear Editor:

As a subscriber to the American Horologist and Jeweler, I have accumulated a number of issues that, for want of a better place, are stacked on a shelf in the store. I feel certain that many other of your subscribers would welcome a binder to keep copies of the magazine in a neater, more practical manner. As a source of information they are priceless, but much time and effort are lost in attempting to find the desired copy.

I have in mind a binder with these points to be considered:

1. To hold six copies (twelve would be cumbersome and hard to handle).

2. A semi-annual index printed on a single sheet to either be placed inside the front cover or in a separate file, the index to be either by subject, alphabetical or even better, to be cross-indexed. If this index could be expanded to contain the information in Mr. Samelius' and Mr. Coleman's department, its value would be increased many times over.

Yours truly,
GEORGE DOTY

303 South Main Street
Findlay, Ohio.

COMMENDATION ON ORGANIZATIONAL ARTICLE

Dear Editor:

I have just finished reading the article, "Should Horologists Organize?" by Robley D. Stevens, LL.B, J. D. I have found this article very timely and informative; also I wish to state that I agree with the second fellow who was interviewed in the article.

Now there is a fellow who knows and appreciates the fact that watchmakers should be organized. I too firmly believe that organizing will eliminate the unscrupulous and inferior workman the same as the medical association gets rid of the quacks who would undermine a dignified profession that the sincere ones have worked hard to build.

A watchmaker's uppermost consideration should be his well pleased customer and the pride that he puts in his repair, the pride that will repay him many-fold by bringing in more work. He need never worry about the fellow next door who makes fast "turn-over", using slip-shod methods. In retail, too, a watch sold for four times the actual retail price, this customer will find out he was "stung" as soon as his watch needs repair and he asks the watchmaker what he thinks it is worth. Is this fair to an honest business man and to the customer? I have seen the work of the so-called "watchmaker" in the repairs I take in. It's appalling how a sloppy workman can depreciate the value of a fine instrument and timepiece that has taken years of research to bring to the standard of today.

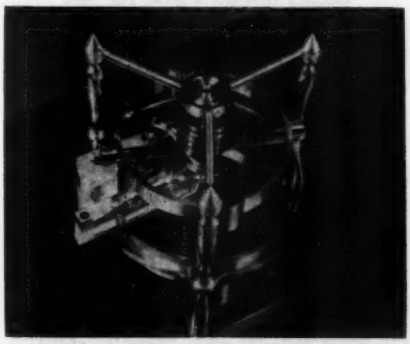
In Dr. Stevens' article he says, " . . . some magazine which may be in the market for such research" (concerning the chiseling of estimates in repairs). I read just such an article in the Readers' Digest Consumers Survey (a public service to its readers) in 1942. The title, I believe, was "The Watch Repairman Will Get You If You Don't Watch Out". In this article the surveyor took a new watch and unscrewed the crown wheel and took it to numerous watchmakers, and he was surprised to find about two of them were honest; one of these even tightened the screw without charge. My friends and customers have mentioned this article to me even up to two months ago.

Prior to the time I became a watchmaker I made this statement to the repairman who worked on my watch: "Watch repairing is the only skilled trade that has not lost its art in fine workmanship". Today I am sorry I made that statement, as I realize that the watch repair trade, too, has sloppy, money-mad workers the same as the other skilled trades.

Yours truly,
MRS. G. DER MINASIAN

2 Main Street
Groveland, Massachusetts

CHRONOMETER ESCAPEMENT



The model shown above was designed and built by Fred Whitfield of Crystal Lake, Ill. The mechanism was somewhat simplified to suit materials at hand, and the only machine tool used was a watchmaker's lathe—not equipped with slide rest or wheel-cutting attachment. The balance measures about 3" in diameter and takes a good swing driven by an alarm clock works.

Used as a window display the chronometer model attracts considerable interest from customers. Whitfield is working now on a tourbillon lever escapement of his own variation.

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POSITIONS WANTED, $1.00 for the first 25 words, five cents for each additional word.

BOX NUMBERS, or Blind advertisements, 50 cents additional for postage and handling.

BOOKS

SWISS WATCH AND JEWELRY JOURNAL—All-English Language Edition of the "Journal Suisse d'Horlogerie et de Bijouterie." Finest source of information on watch making, watch repairing and watch selling. Issued bi-monthly. Subscription $5.00 one year, $9.00 two years. U. S. Agents: OVERSEAS PUBLISHERS' REPRESENTATIVES, 66 Beaver Street, New York 4, N. Y.

"KNOW THE ESCAPEMENT"
Revised to make it the simplest, easiest to learn and yet the most advanced text book on the escapement. Over 200 pages, divided for easy reference. Only $5.00. Barkus Horological Laboratories, 2621 University Ave., San Diego, California.

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Offers practical, time-saving help on clock repair.
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At leading jewelers' wholesale supply houses or order direct from publisher:
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Watchmakers' Journal contains helpful hints on watch repairing. ($1.00 year.) Sample copy 20c. Dean Co., Box 3218, Daytona Beach, Fla.

HOROLOGY BOOKS—Catalogues, Pamphlets. Send your wants. Free list. H. Birnbaum, 218 East 59th Street, New York 22, N. Y.

Illustrated quiz questions, problems and solutions for students, apprentices, and advanced watchmakers. Helpful for exams; reviews; reference. 333 QUESTIONS and ANSWERS. $1.75 postpaid. Seven-day return privilege. Chicago School of Watchmaking, 1608 N. Milwaukee Avenue, Chicago 47, Illinois, Room 1103-D.

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Watchmaker desires position with future. School graduate. Two years bench and retail experience. Presently employed. Good reason for desiring change. Married, 28 years old. Eager to establish permanent home. For further information, write to Dept. N-2, American Horologist and Jeweler, P. O. Box 7127, Capitol Hill Station, Denver, Colorado.

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Swiss music boxes suitable for novelties. Single tunes $1.00. Double tunes $2.00. Also musical novelties catalog 10c. Bell Music Box Company, 205A Amsterdam Ave., New York 24, New York.

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For Sale—Small established Jewelry Store and Repair Business. Also carry small household appliance lines. Will sell stock and equipment complete for $10,000.00. Contact Pellicane Jewelers, 138 South Main Street, Hightstown, New Jersey, P. O. Box 169.

Modern jewelry store in prosperous Ft. Worth, Texas. Protected lease in busy suburban shopping center. Sacrifice for inventory about $10,500.00. Swanson's Jewelry, 4131 West Rosedale, Ft. Worth, Texas.

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"Chronographs and Automatics"
We offer expert watch repairing at lowest prices. All Work guaranteed. We Pay Postage. Write for estimate.
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P. O. B. 107, G. P. O.
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Ring stones: Genuine, synthetic, imitation, any size or shape. Stones set, rings sized. Titania gems, any size also mounted. Ace Lapidary, Box 67, Jamaica, N. Y.

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Parts made for any make clock
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Goldsboro, N. C.

● SERVICES AND TRADE WORK (Cont.) ●

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OUR SHOP . . . The Jewelers' Watchmaker
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Stone Encrusting, Engraving and Drilling, Precious and Semi-Precious stones furnished and cut to fit your rings. Lodge emblems encrusted and engraved. Coats of Arms. Monograms and Initials. Military Insignias. Fraternal Emblems. Stone Cameos up to 50 Mm. size. Onyx Crosses. Special Jobs Invited. Braunfeld & Mehlman, 108 Fulton Street, New York City.

Boston, Massachusetts. Guaranteed Trade Watch Repairing. Chronographs a specialty. Excellent service. Electronic timing. Prices on request.
Charles L. Birdsall
Jewelers Building
373 Washington Street

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BY
LICENSED WATCHMAKERS
ALL WORK TIMED ON
A WATCHMASTER
REFERENCES AND PRICE
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ALEXANDER'S WATCH REPAIRING
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Send me your chronographs only.
Fast service.
Prices on request.
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EXPANSION BANDS REPAIRED
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ALL BANDS FINISHED LIKE NEW
OUR WORK GUARANTEED
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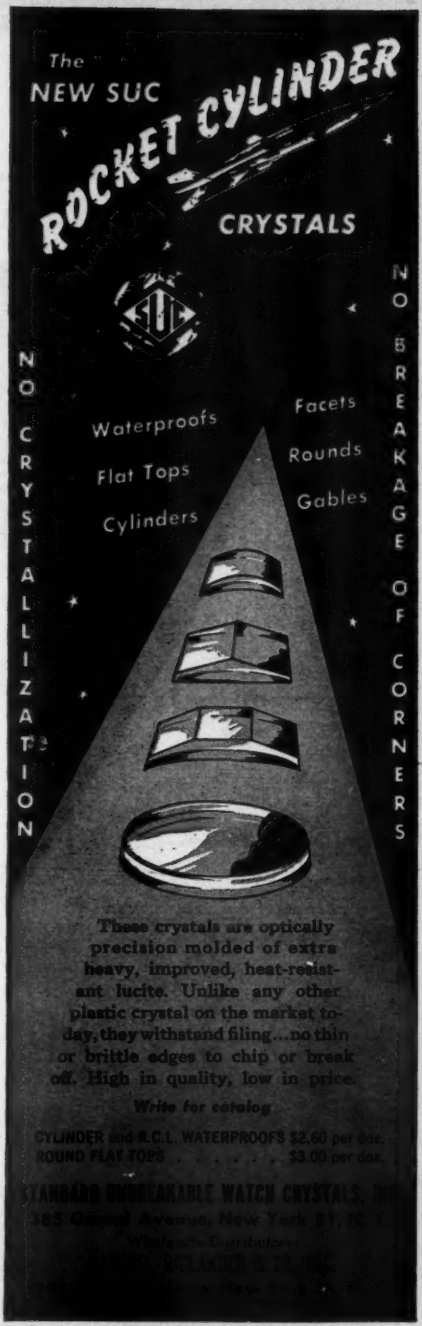
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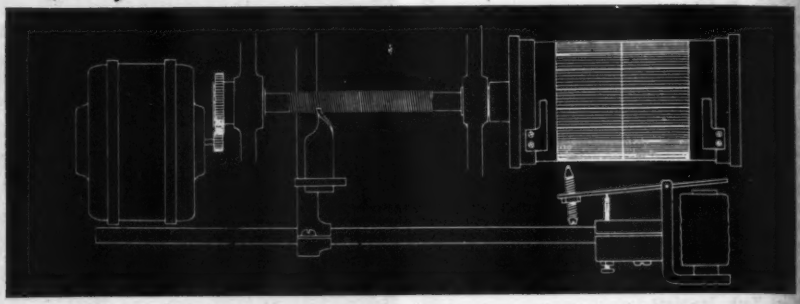

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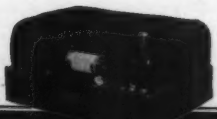

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